UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Washington, D.C. 20235

F/CM6:CB

SEP 18 1981

TO: Distribution*

FROM: F/CM6 - Roland Finch

SUBJECT: Review of Amendment 1 for the Fishery Management Plan for Groundfish in the Bering Sea/Aleutian Island Area.

Attached for your review and comment is Amendment 1 to the Bering Sea/Aleutian Island Area Groundfish Fishery Management Plan (FMP). To place this amendment in perspective we are currently:

1) preparing the paperwork to implement the original FMP on January 1, 1982.

2) preparing paperwork to approve and propose implementing regulations for Amendment 1-a (which limits the foreign incidental catch of chinook salmon) and Amendment 2 (which updates certain specifications) to the FMP and to implement these Amendments on January 1, 1982.

We are not attempting to meet a January 1, 1982, deadline for Amendment 1.

I would appreciate your response, on Amendment 1, including negative comments, by October 16. Please address comments or questions to Clem Bribitzer (634-7449).

Attachment

Distribution*

F/UD1 - Hutchinson
F/CMx1
F/CM1
F/CM5
F/CM6 - Martenson, Siegel
F/CM7
F/IA - Beasley
Fx51 - Blatt
Fx53 - Neil Williams
F/CMx2
Fx54 - Wise
F/SR1 - Thompson
F/SR4 - Wheeland
GCF
F/MM
F/HP
PP - Wood
CZx4 - Tolson
F/CM - Fricke

North Pacific Fishery Management Council

Clement V. Tillion, Chairman
Jim H. Branson, Executive Director

Suite 32, 333 West 4th Avenue
Post Office Mall Building

Mailing Address: P.O. Box 3136DT
Anchorage, Alaska 99510

Telephone: (907) 274-4563
FTS 271-4064

August 13, 1981

Mr. William H. Stevenson
Acting Assistant Administrator
National Marine Fisheries Service
3300 Whitehaven Street, Page 2
Washington, D.C. 20235

Dear Bill:

We are pleased to submit 50 copies of Amendment #1 to the Fishery Management Plan for Groundfish in the Bering Sea/Aleutian Islands area.

This amendment will: (1) establish a multi-species, multi-year optimum yield for the groundfish complex; (2) establish a new schedule for the apportionment of groundfish reserves to DAH and TALFF; (3) reduce restrictions on the domestic trawl fishery operating in the Bristol Bay Pot Sanctuary and the Winter Halibut Savings Area; (4) delegate authority to the Regional Director to issue in-season field orders for conservation purposes and to avoid gear conflicts; and (5) designate two new areas between 170°W and 172°W longitude where foreign fishing will be permitted seaward of three nautical miles (rather than the present twelve) from the baseline used to measure the U.S. territorial sea.

The first two measures will make this a multi-year FMP, greatly reducing the need for amendments and increasing NMFS ability to manage the resource in a timely and flexible manner. The concept is innovative, but we are convinced it is sound and another advance in management concepts. I think you will be as intrigued by this approach as those of us who have been working on it for the past year.

The enclosed package contains the Federal Register notice, proposed changes to the Code of Federal Regulations, and changes to the FMP. The amendment package has been reviewed by the Region and by GCAK.

Sincerely,

Jim H. Branson
Executive Director

cc: Robert W. McVey

JP

33C/G

NORTH PACIFIC FISHERY MANAGEMENT COUNCIL

Bering Sea/Aleutian Islands Groundfish Fishery Management Plan

Amendment #1

Changes to the FMP

Introduction:

The North Pacific Fishery Management Council (NPFMC) proposes the following changes to the Bering Sea/Aleutian Islands Fishery Management Plan (FMP):

1. Replace Section 11.0, OPTIMUM YIELD (OY) such that the resource is managed as a groundfish complex rather than on a species by species basis. The Amendment establishes a multi-species, multi-year OY concept accompanied by a new system of reserves and schedule for release of reserves.

2. Replace Section 13.0, ALLOCATIONS BETWEEN FOREIGN AND DOMESTIC FISHERMEN, to reflect the changes made in Section 11.

3. Replace Section 14.0, MANAGEMENT REGIME with a new section which will encourage the development of the domestic trawl fishery.

4. Replace Appendix III, Description of Closed Areas, to reflect the changes made in Section 14.0.

5. Replace Annex I, Derivation of Acceptable Biological Catch, with the latest status of stocks information, and resultant Maximum Sustainable Yields (MSY), Equilibrium Yields (EY) and Acceptable Biological Catches (ABC), for informational and illustrative purposes.

6. Amend Annexes II, III, IVA, IVB and IVC to reflect changes made in Section 11.0, 13.0, and 14.0, and to contain the most current information available as of the amendment's adoption by the NPFMC.

1. Section 1, Table of Contents, substitute for 11.0 OPTIMUM YIELD and 14.0 PROPOSED MANAGEMENT REGIME and add to the LIST OF TABLES the following:

LIST OF TABLES

2. In Section 3.0, the Executive Summary, replace the Table on page 3-1a with the attached amended table, and delete the table on page 3-1b.

INITIAL TOTAL ALLOWABLE CATCH (TAC), DOMESTIC ANNUAL HARVEST (DAH)
AND TOTAL ALLOWABLE LEVEL OF FOREIGN FISHING (TALFF)
(metric tons)

Species Group	Areas [1]	Initial TAC [2]	Initial Reserve [3]	Initial Allocation [4]	Initial DAH [5]	Initial TALFF [6]
Pollock	I,II	952,000	95,200	856,800	19,550	837,250
	III,IV	32,200	3,220	28,980	--	28,980
Pacific Ocean Perch	I,II,III	3,500	350	3,150	1,380	1,770
	IV	3,500	350	3,150	1,380	1,770
Other Rockfish	I,II,III	7,000	700	6,300	775	5,525
	IV	7,000	700	6,300	775	5,525
Sablefish	I,II,III	2,100	210	1,890	930	960
	IV	700	70	630	470	160
Pacific Cod		70,000	7,000	63,000	43,265	19,735
Yellowfin Sole		84,000	8,400	75,600	26,200	49,400
Turbots		56,000	5,600	50,400	1,075	49,325
Other Flatfish [7]		70,000	7,000	63,000	4,200	58,800
Atka Mackerel	IV	42,000	4,200	29,300	100	29,200
Squid		28,000	2,800	16,700	50	16,650
Other Species		42,000	4,200	37,800	2,000	35,800
TOTAL		1,400,000	140,000	1,243,000	102,150	1,140,850

1/ Statistical Areas
2/ From Section 11.4 and Table 23.1
3/ From Table 23.1
4/ From Table 23.1
5/ From Annex II
6/ From Annex III
7/ Excluding Pacific halibut

3-1a

3. Add the following to the end of Section 4.3.1.d, Optimum Yield (OY):

The OY of the groundfish complex is made up of total allowable catches (TAC's) of individual species groups. An initial and final TAC is established during a fishing year, as described in Sections 11.4 and 11.5.

4. Substitute the following for Section 4.3.3, Determination of total allowable level of foreign fishing (TALFF):

The foreign allowable catch is determined by deducting the expected domestic annual harvest and the reserves from initial and final allocations, as described in Sections 11.4 and 11.5.

5. Replace Section 11.0 OPTIMUM YIELD (OY) with the following:

11.0 OPTIMUM YIELD (OY) and TOTAL ALLOWABLE CATCH (TAC)

11.1 Maximum Sustainable Yield (MSY) of the Groundfish Complex

The groundfish complex and its fishery are a distinct management unit of the Bering Sea. The complex has more than 10 commercially important species and many others of lesser or no commercial importance. This complex forms a large subsystem of the Bering Sea ecosystem with intricate interrelationships between predators and prey, between competitors, and between those species and their environment. Therefore, the productivity and MSY of groundfish should be conceived for the groundfish complex as a unit rather than for many individual species groups.

The MSY of the groundfish complex is in the range of 1.7 - 2.4 million mt. This is calculated by summing the MSY's of individual species groups that are derived from species-by-species analysis. A reasonable verification of the MSY for the groundfish complex is derived by averaging the 1968-1977 catches when the fishery went through periods of growth, peak, decline, and some stability (see Section 5.2 on History of Exploitation). The average catch was 1.8 million mt with a range of 1.1 - 2.4 million mt.

The latest version of the Bering Sea ecosystem model developed by the Northwest and Alaska Fisheries Center (Granfeldt 1979) shows that the minimum sustainable exploitable biomass for the groundfish complex covered by this FMP is about 9.5 million mt. This PROBUB (Prognostic Bulk Biomass) model simulated the principal components of the ecosystem (mammals, birds, demersal fish, semi-demersal fish, pelagic fish, squid, crabs, and benthos) and considered their fluctuations in abundance caused by predation, natural mortality, environmental anomalies, and fishing. The magnitude of the minimum sustainable exploitable biomass (9.5 million mt) shows that the MSY may be even higher than 1.7 - 2.4 million mt.

11.2 Allowable Biological Catch (ABC) of the Groundfish Complex

The ABC of the groundfish complex is 1.4 to 2.0 million mt, or approximately 85% of the MSY. The deviation from MSY reflects the combined influence of several factors such as the quality of the data used, condition of stocks, and inadequacies in population and ecosystem models.

The 15% reduction from MSY reduces the risks associated with relying upon incomplete data and/or models which incorporate inaccurate or contestable assumptions. The ABC range encompasses the summed ABC's of individual species for 1978-1981 (see Annex I, Table I.1).

Three elements of the groundfish complex, sablefish, Pacific ocean perch, and Pacific halibut, are currently depleted and rebuilding these stocks may not be achieved by lowering catches of these individual species alone. In addition, pollock, yellowfin sole, sablefish, and Pacific ocean perch stocks have demonstrated significant declines and population stress when approximately 2 million mt of groundfish were reportedly removed from the complex in the past. Because of reporting inaccuracies during the time this stress occurred, it is believed that the actual groundfish harvests at this time were well over 2 million mt, and that they may have approached 3 million mt.

One possible result of ABC greater than 2.0 million mt could be a shift in ecosystem production to species of little or no commercial value. The ABC is predicated on the desire to maintain a large resource biomass so that the fishery is not solely dependent upon young recruits each year and to maintain a "biological cushion" to compensate for variations in upper trophic level production.

11.3 Optimum Yield of the Groundfish Complex

The optimum yield (OY) of the management unit equals ABC, 1.4-2.0 million mt. This range will be the OY of the Bering Sea/Aleutians groundfish complex covered by this FMP unless the plan is amended. An amendment will be made when the status of the groundfish complex changes substantially from the present condition or when socioeconomic considerations dictate that OY should fall outside the present range.

The OY of the groundfish complex is made up of total allowable catches (TAC's) of individual species groups. An initial and final TAC is established for each species group during a fishing year. The total initial TAC's equal the low end of the OY range (1,400,000 mt), as described in Section 11.5.

The final TAC for each species or species group will be determined by the Alaska Regional Director of the National Marine Fisheries Service (NMFS) by April 1 of the fishing year through his rulemaking authority. Prior to the Regional Director's determination, the Council will recommend final TAC's to him based on the best available data concerning the fishery. In order for the Council to make these recommendations, the most current status of stocks information available from the Northwest and Alaska Fisheries Center NMFS, will be reviewed by the Council in December of the preceding year.

The status of stocks information will form the basis for determining species or species group ABC's through analytical procedures similar to those illustrated in Annex I. Data may include commercial fishery and research survey data and information from scientific meetings with foreign and U.S. scientists.

The Regional Director may adopt the ABC's from the status of stocks information as the final TAC's, or modify them for socioeconomic reasons that are supported by reliable data and analysis, and are recommended to him by the Council.

The total of the final TAC's must be within the OY range of 1.4-2.0 million mt.

11.4 Initial TAC

Total initial TAC is automatically set at 1,400,000 mt at the beginning of the year. It is apportioned into (a) Initial Reserves and (b) Initial Allocations to the Fishery.

11.4.1 Initial Reserves

Initial Reserves are separated into (1) a reserve for correction of operational problems, and (2) a reserve for domestic fishery expansion. The Initial Reserve for Correction of Operational Problems is set at 1% of the mid-point of the OY range--17,000 mt. This reserve will be distributed among species groups and among nations during the fishing year at the discretion of the Regional Director to prevent premature closure of fishing for groundfish species when the TAC, DAH, or TALFF for one of them has been taken more quickly than was expected or normal. This reserve is so small relative to the groundfish resource that its release is expected to have insignificant biological consequences to the stocks.

The Initial Reserve for Domestic Fishery Expansion is composed of 10% of each initial TAC. Therefore, the Initial Reserve for Domestic Fishery Expansion is 140,000 mt. This Reserve may be released to DAH anytime during the fishing year by the Regional Director.

11.4.2 Initial Allocations to Fishery

Initial Allocations to DAH and TALFF by species groups are shown in Table 23-1. They will remain the same from year-to-year unless this FMP is amended and will total 1,243,000 mt, the difference between the total of the initial TAC's and the initial reserves.

11.5 Final TAC

The Final TAC for each species and species group is determined by the Regional Director through rulemaking following consultation with the Council during March according to Section 11.3. When the Final TAC's are determined, the Initial Reserves and Initial Allocations to the fishery are revised to Final Reserves and Final Allocations to the fishery.

11.5.1 Final Reserves

The Final Reserve for Correction of Operational Problems remains the same as before--1% of the mid-point of the OY range or 17,000 mt. This reserve will be distributed among species groups and among nations in any amount and at any time during the fishing year at the discretion of the Regional Director to prevent premature closure of fishing for groundfish species when the TAC, DAH, or TALFF of one of them has been taken more quickly than was expected or normal. This reserve is so small that its release is expected to have insignificant biological consequences to the stocks.

This reserve may be released to DAH or TALFF by the Regional Director when the premature closure problems are no longer likely to arise.

The Final Reserve for Domestic Fishery Expansion is the sum of each 10% reserve of the final species group TAC's.

11.5.2 Final Allocations to Fishery

As described in 11.5.1, additional amounts of groundfish authorized for final TAC's on April 1 of the fishing year are reduced by ten percent to form the Final Reserve. The remaining portion of additional amounts of groundfish species or species groups authorized for final TAC's shall be apportioned to DAH or TALFF as deemed necessary by the Regional Director upon consideration of status of stocks, progress of the domestic groundfish fishery, or any other information deemed pertinent by the Regional Director, after consultation with the Council.

Final TALFF equals the sum of the final TAC's minus reserves minus final DAH.

11.5.2.1 Release of Reserve to DAH.

At any time, the Regional Director may reassess DAH and apportion to DAH any amounts from the reserve for domestic fishery expansion he determines will be utilized by United States fishing vessels during the current year.

11.5.2.2 Release of Reserve and Unneeded DAH to TALFF.

In consultation with the North Pacific Fishery Management Council, the Regional Director shall apportion the reserve for domestic fishery expansion to TALFF according to the following schedule: not more than 40% at the beginning of April, not more than 80% at the beginning of June, and the remainder of the reserve that has not already been apportioned to TALFF or DAH at the beginning of August.

As soon as practicable after August 1 and after consultation with the North Pacific Fishery Management Council, the Regional Director shall apportion to TALFF that part of the DAH he determines will not be harvested by U.S. fishermen during the remainder of the fishing year.

Table 23.1--Bering Sea/Aleutians groundfish MSY, ABC, OY, and initial TAC's in metric tons.

MSY	=	1,700,000 - 2,400,000 metric tons
ABC	=	85% MSY = 1,400,000 - 2,000,000 metric tons
OY	=	1,400,000 - 2,000,000 metric tons
Total Initial TAC's	=	1,400,000 metric tons (low end of OY)
Initial Reserves	=	17,000 metric tons -- Regional Director's Reserve for Correction of Operational Problems 140,000 metric tons -- 10% of Initial TAC's as Reserve for Domestic Fishery Expansion
Initial Allocation to Fishery	=	1,243,000 metric tons (Initial TAC's - Reserves) -- Amounts to be allocated to initial DAH and TALFF

Species group	Areas [1]	Production Factor [2]	Initial TAC [3] (1,400,000 mt)	Initial reserve for domestic fishery expansion [4]	Initial Allocation to Fishery [5]
Pollock	I, II	.6800 [7]	952,000	95,200	856,800
	III, IV	.0230 [7]	32,200	3,220	28,980
Pacific ocean perch	I, II, III	.0025 [7]	3,500	350	3,150
	IV	.0025 [7]	3,500	350	3,150
Other rockfishes	I, II, III	.0050	7,000	700	6,300
	IV	.0050	7,000	700	6,300
Sablefish	I, II, III	.0015 [7]	2,100	210	1,890
	IV	.0005 [7]	700	70	630
Pacific cod		.0500	70,000	7,000	63,000
Yellowfin sole		.0600	84,000	8,400	75,600
Turbots		.0400	56,000	5,600	50,400
Other flatfishes [8]		.0500	70,000	7,000	63,000
Atka mackerel	IV	.0300	42,000	4,200	29,300 [6]
Squid		.0200	28,000	2,800	16,700 [6]
Other Species		.0300	42,000	4,200	37,800
TOTAL		1.0000	1,400,000	140,000	1,243,000

See next page for footnotes.

Table 23-1, continued:

1/ Areas as defined in Figure II-1.

2/ Long term production of individual species groups relative to that of entire groundfish complex. See Table 23-2.

3/ Determined by multiplying "Production Factor" times 1,400,000 mt (low end of OY range).

4/ 10% of initial TAC.

5/ Initial TAC - Reserves

6/ Reserve for Correction of Operational Problems (17,000 mt) taken from Atka mackerel and squid categories (8,500 mt each) because actual catches have not approached initial species TAC.

7/ Depleted stocks, production factor set at 50 percent long-term value; pollock production increased by corresponding amount to rectify total.

8/ Excluding Pacific halibut.

Table 23.2 - Determination of relative yield of the Bering Sea/Aleutian groundfish complex by species groups.

Species Group	Region[1/]	Commercial Catch (69-79)	Equilibrium Yield (75-79)[2/]	Ecosystem Model Equilibrium Biomass[3/]	Relative Yield[4/]
Pollock	(Areas I, II)	.758	.650	.629	.680
	(Areas III, IV)	.002	.063	---	.010
Pacific ocean perch	(Areas I, II, III)	.010	.004		.005
	(Area IV)	.020	.009	.048	.010
Other rockfish	(Areas I, II, III)	.002	.002		.005
	(Area IV)		.002		.005
Sablefish	(Areas I, II, III)	.005	.003	.005	.003
	(Area IV)	.005	.001		.002
Pacific cod		.040	.040	.073	.050
Yellowfin sole		.050	.092	.039	.060
Turbots		.046	.057	.024	.040
Other flatfish		.020	.028	.064	.050
Atka mackerel		.010	.012	.051	.030
Squid		.002	.006	.062	.020
All others		.030	.031	---	.030
Pacific halibut				.005	---
TOTAL		1.000	1.000	1.000	1.000

1/ Applies to entire Bering Sea/Aleutian Region combined unless otherwise indicated.

2/ From status of stocks analyses.

3/ From ecosystem model (Prognostic Bulk Biomass Model) which took into consideration prey-predator interrelationships of all fish, mammals, and birds.

4/ Weighted average of all three assessments of relative yields, as estimated by NMFS scientists.

6. Substitute the following for Section 13, Allocations Between Foreign and Domestic Fishermen:

13.1 Reserve

U.S. participation in the fishery in the near future is expected to consist of a relatively modest catch for crab bait, a growing Pacific cod fishery, joint ventures for yellowfin sole, pollock, and Atka mackerel and limited efforts for other bottomfish production.

In order to prevent OY from being exceeded without preventing unexpected domestic fishery development; i.e., an unanticipated increase in U.S. catching capability and intent, 10% of each initial and final TAC will be held in reserve, as described in Section 11.4 and 11.5. Specific initial reserve amounts are shown in Annex II and Table 23-1.

The reserve for domestic fishery expansion will be released by the Regional Director in accordance with Section 11.5.2.1 and 2. All of this reserve will be made available to foreign fishermen or reserved for domestic use by August of each year.

13.2 Total Allowable Level of Foreign Fishing (TALFF)

The initial TALFF for each species shall be determined by the equation: Initial TALFF = Initial TAC - Initial DAH - Initial Reserves.

The final TALFF for each species shall be determined by the equation: Final TALFF = Final TAC - Final DAH - remaining reserves.

Initial DAH is prescribed in Annex II and initial TALFF is prescribed in Annex III.

7. Replace Section 14.0, MANAGEMENT REGIME, with the following:

14.0 MANAGEMENT REGIME

14.1 Management Objectives

Four priority objectives dictate the philosophy of management for the groundfish fishery in the region:

A. Provide for rational and optimal use, in a biological and socio-economic sense, of the region's fishery resources as a whole;
B. Minimize the impact of groundfish fisheries on prohibited species and continue the rebuilding of the Pacific halibut resource;
C. Provide for the opportunity and orderly development of domestic groundfish fisheries, consistent with (A) and (B) above; and
D. Provide for foreign participation in the groundfish fishery, consistent with all three objectives above, to take the portion of the optimum yield not utilized by domestic fishermen.

14.2 Area, Fisheries, and Stocks Involved

This Fishery Management Plan and its management regime governs:

A. Fishing by foreign and United States vessels in the U.S. Fishery Conservation Zone of that portion of the North Pacific Ocean adjacent to the Aleutian Islands which is west of 170° W, and of the entire Bering Sea (See Figure 26).

B. All stocks of finfish and marine invertebrates except salmonids, shrimps, scallops, snails, king crab, Tanner crab, Dungeness crab, corals, surf clams, horsehair crab, lyre crab, Pacific halibut, and herring which are distributed or are exploited in the area described in A, above.

Four categories of species groups (Annex VI) that are likely to be taken by the groundfish fishery and to each of which the optimum yield concept is applied somewhat differently are:

1. Prohibited Species -- those species groups the harvest of which must be avoided and which must be immediately returned to the sea when caught and brought aboard. Records of catch of each species must be maintained. These include salmonids, shrimps, scallops, snails, king crab, Tanner crab, Dungeness crab, corals, surf clams, horsehair crab, lyre crab.
2. Target Species -- species groups which are commercially important, targeted upon by the groundfish fishery, and for which a sufficient data base exists that allows each to be managed on its own biological merits. A specific TAC applies to each species group. Records of catch of each species group must be maintained.
3. Other Species -- species groups which currently are of slight economic value and not generally targeted upon. This category, however, contains species with economic potential or which are important ecosystem components, but sufficient data are lacking to manage each separately. Accordingly, a single TAC applies to this category as a whole. Records of catch of this category as a whole must be maintained.
4. Non-specified Species -- species groups of no current or foreseeable economic value taken in the fishery only as an incidental by-catch to target fisheries. These include all finfish and marine invertebrates, except those listed in 1-3, above. Virtually no data exist which would allow population assessments, but occasional records from U.S. observers aboard foreign and U.S. vessels show no noticeable decline in abundance. The OY for this category is the amount which is taken incidentally while fishing for target species, whether retained or discarded. If retained, records must be kept. (NOTE: If observer or enforcement records show that any species in this category is being actively targeted upon or that the abundance of any species is being substantially reduced, that species will be transferred to another species category through amendment of the plan.)

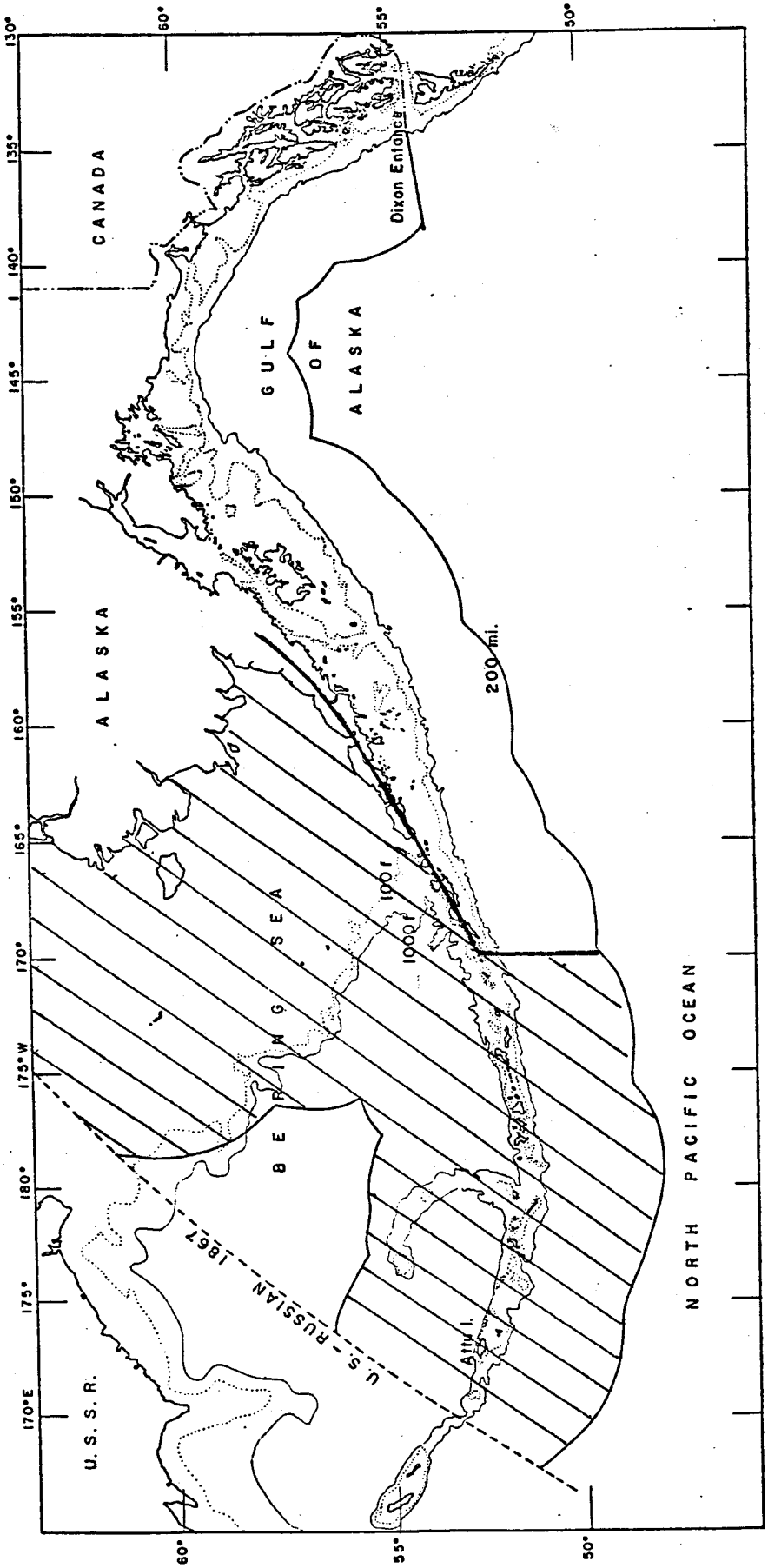


Figure 26.--Area (diagonal lines) over which this Fishery Management Plan applies.

14.3 Fishing Year

The fishing year shall be the calendar year (January 1 -December 31). Should this FMP be implemented at a date other than January 1, fish allocations will be prorated as if implementation had begun the previous January 1.

14.4 Management Measures -- Domestic Fishery

14.4.1 Permit Requirements

All U.S. vessels harvesting and retaining groundfish or engaging in support activities in that part of the fishery conservation zone governed by this FMP must have on board a current permit issued by the Secretary of Commerce, or, if considered acceptable by the Secretary, a State of Alaska vessel license.

14.4.2 Prohibited Species

United States vessels must minimize their incidental harvest of Pacific halibut, salmon, Tanner crab, and any other species the fishery for which in the area governed by this FMP is governed by another FMP, and shall return those species to the sea promptly if they are taken.

14.4.3 Fishing Area Restrictions

A. General

None

B. Trawl Fishery

1. Area A -- "Bristol Bay Pot Sanctuary" (as described in Appendix III and Figure 27) -- domestic trawling will be permitted year-round on an experimental basis and be monitored closely by observers. Those domestic vessels fishing for a "species venture" will be subject to the following restrictions:
   a. Definition of Species Venture.
      A species venture is defined to be any one of the following:
      (1) joint ventures using a foreign processor of a particular flag and controlled by either a particular American partner or a foreign entity directly;
      (2) individual factory trawler operations;
      (3) domestic joint ventures with at sea processing by a particular processor/buyer;
      (4) trawl-caught deliveries to a particular buyer.
   b. For each species venture domestic trawling will be permitted until the annual incidental interception of Pacific halibut exceeds the guideline level as determined by the appropriate analysis of relevant data.

      The guideline level shall be one percent by line weight of the total harvest of each species venture. Each species venture's harvest shall be monitored on a current time basis by observers or other appropriate means. At the

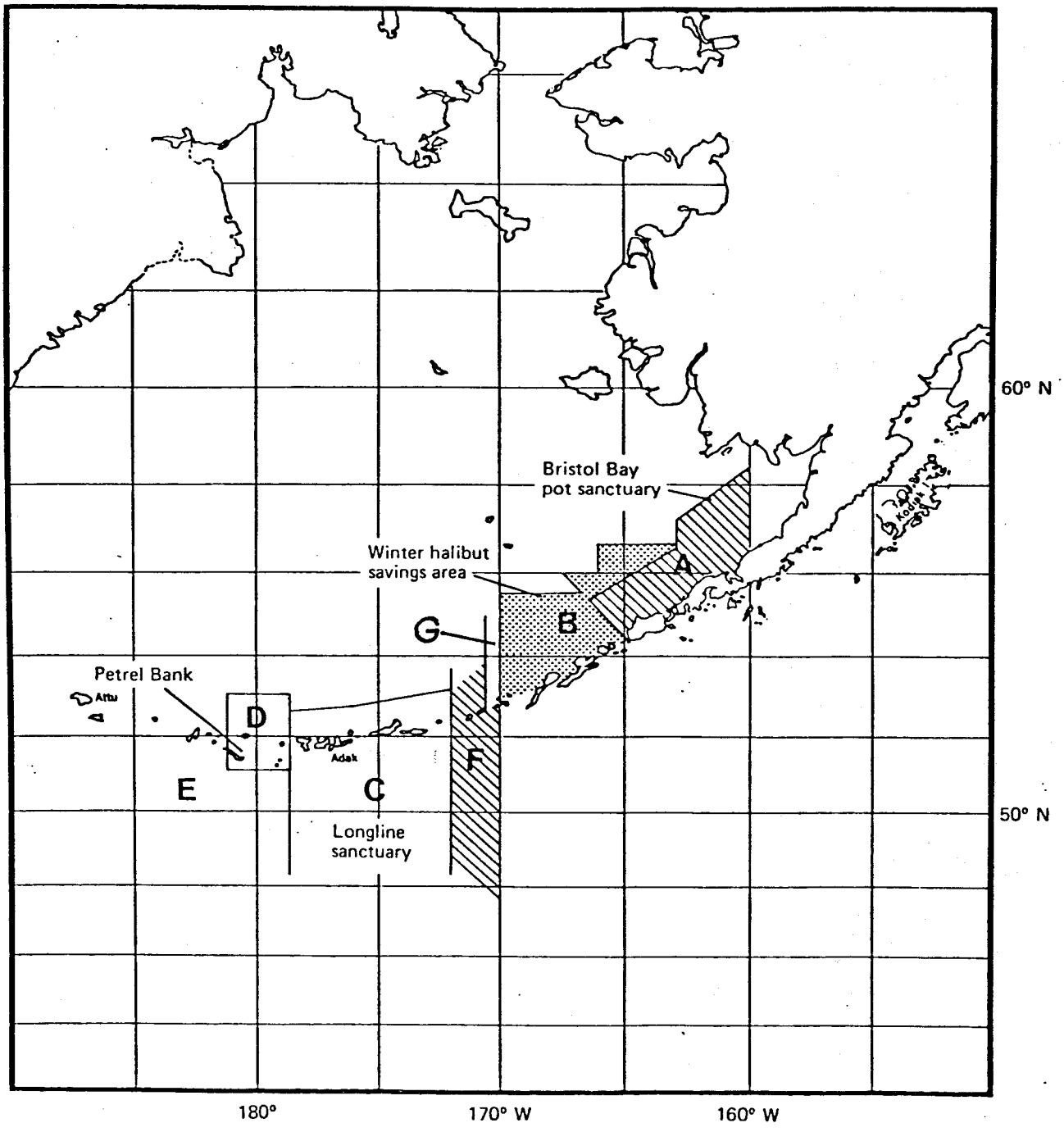


Figure 27. General location of areas described in management measures for the Bering Sea/Aleutians groundfish fisheries (see Appendix II for geographical coordinates).

initial 10,000 metric ton level, the incidental catch of Pacific halibut shall be determined. Upon achieving a 20,000 mt catch, if a species venture's incidental catch of Pacific halibut exceeds one percent by weight of total catch, the species venture shall be restricted to pelagic trawl gear for the remainder of the fishing year when trawling in Area A. If a species venture's incidental catch of Pacific halibut is one percent or less, then the species venture may continue bottom trawling subject to the one-percent incidental catch of Pacific halibut restriction for each additional 20,000 mt catch level achieved.

Domestic fishermen trawling in Area "A" shall provide appropriate data and observation from their own records relevant to the nature of their fishing efforts, and shall cooperate with personnel assigned for scientific study of fishing activity in Area "A".

The Council will consider relevant data on all prohibited species accumulated and analyzed from Area A and will take appropriate action as necessary.

2. Area B -- "Winter Halibut Savings Area" (as described in Appendix III and Figure 27):
   a. December 1 - May 31 -- domestic trawling will be permitted on an experimental basis and monitored closely by observers.
   b. June 1 - November 30 -- no closures.

   Rationale -- To reduce high incidental catches and mortality of juvenile halibut which are known to occur in winter concentrations in the Bristol Bay Pot Sanctuary and the Winter Halibut Savings Area while allowing some expansion in the traditional crab-bait trawl fishery and the development of a domestic groundfish fishery for human consumption.

3. Other Areas -- no closures

C. Longline Fishery

1. Area B - Winter Halibut-Savings Area (as described in Appendix III and Figure 27):
   a. December 1 - May 31 -- domestic longlining will be permitted landward of the 500 m isobath until the total U.S. longline catch (excluding halibut) from this area exceeds 2,000 mt.
   b. June 1 - November 30 -- no closures.

   Rationale -- To reduce high incidental catch and mortality of juvenile halibut which are known to occur in winter concentrations in the Winter Halibut-Savings Areas while allowing for some expansion in the domestic setline fishery for species other than halibut.

2. Other Areas -- no closures

D. In-Season Adjustment of Time and Area

The Regional Director or his designee may issue field orders adjusting time and/or area closures for conservation reasons. The field orders may open or close fishing areas, or parts thereof, and fishing seasons based upon the following considerations:

1. the effect of overall fishing effort within a fishing area or part thereof;
2. catch-per-unit of effort and rate of harvest;
3. relative abundance of stocks within the area in comparison with pre-season expectations;
4. the proportion of prohibited species being caught;
5. general information on the condition of stocks within the area;
6. information pertaining to the State of Alaska guideline harvest level for species within a fishing area or part thereof; or
7. any other factors necessary for the conservation and management of the groundfish resource.

Rationale -- The TAC figures adopted under the procedures and standards presented in this FMP, which are based upon projections of the status of stocks, economic and other conditions several months in advance of the actual conduct of the fishery may not be realizable without harm to the fishery resource, in light of stock conditions which are revealed in the course of the fishery. Under such circumstances it is appropriate for conservation purposes only, that the Regional Director, in close coordination with the Commissioner of the Alaska Department of Fish and Game, take immediate action by issuing field orders adjusting time and/or area restrictions.

It is expected that the actual area opening and closing dates prescribed in this plan will be adjusted by the Regional Director pursuant to the authority described in this section. Such action is not emergency action that would require amendment of the plan, but an inherent feature of the management regime prescribed in this plan itself.

14.4.4 Gear Restrictions

None

14.4.5 Statistical Reporting Requirements

A. Fishermen Reports

Fishery data compiled for the domestic groundfish fishery should be of the same general degree of precision as those required of foreign fishermen; catch by species, by ½ degree latitude x 1 degree longitude areas, by gear type and vessel class and by month; effort (e.g., hours towed, number of hooks, number of pots, number of landings, number of trips) by gear type and vessel class and by month.

In order to compile such data sets, the performance of individual vessels must be made available. To do so will probably require, in addition to

fish sales tickets made out for each delivery, one or a combination of the following: logbooks, port sampling, and interviews with fishermen.

In addition to collecting this information from domestic vessels which land their catches at Alaskan ports, it must also be collected from those vessels which sell or use their catch for bait on the fishing grounds, from vessels which land their catches in other states, and from vessels which deliver their catches to foreign processing vessels.

Annual data compilations, in the above format, should be available to the Secretary by May 31 of the following year. In addition, preliminary catch data -- by species and by major statistical area (i.e., Areas I, II, III, IV) -- should be compiled by month and made available to the Secretary by the end of the following month.

Arrangements, including financing and schedule of implementation, for the collection, compilation, and summarization of these fishery data will be developed through consultations between officials of NMFS, the State of Alaska, and other states in which landings of catch from this fishery are likely.

B. Processor Reports

All processors of groundfish shall report information necessary for the periodic reassessment of the estimate of Domestic Annual Processing (DAP). The regulations implementing this plan shall specify the information to be reported and the time schedule for reporting.

C. Joint Venture Reports

Persons delivering U.S. caught groundfish to foreign processing vessels shall report information required for periodic reassessment of that portion of DAH to be delivered by United States vessels to foreign processors at sea in "joint ventures" (JVP). The joint venture processor will be responsible for reporting the catch statistics required of domestic trawlers since the entire catch is delivered in cod ends to the joint venture processor, making inventory of the catch by the United States vessel unfeasible. The regulations implementing this plan shall specify the information to be reported and the time schedule for reporting.

D. Non-Processed Fish Reports

Persons catching or delivering non-processed fish for use as bait or for direct consumption shall report information necessary for periodic reassessment of Domestic Non-Processed catch (DNP). The regulations implementing this plan specify the information to be reported and the time schedule for reporting.

14.4.6 Limited Entry

Implementation of a limited entry program is not currently necessary for the Bering Sea/Aleutians groundfish fishery. However, a limited entry program should be designed by the Council during the early stages of domestic fishery

development so that it can be implemented well before the time that the fishery becomes fully or overcapitalized.

14.5 Management Measures -- Foreign Fisheries

14.5.1 Permit Requirements

All foreign vessels operating in this management unit shall have on board a permit issued by the Secretary of Commerce pursuant to the Magnuson Act.

14.5.2 Prohibited Species

A. General

The prohibited species listed in Annex VI may not be retained, and their taking must be minimized in the course of foreign groundfish fishing operations.

B. Conservation of Chinook Salmon

(This section is the same as 14.3.2.2 B, Amendment 1-a)

14.5.3 Fishing Area Restrictions

A. General

1. No harvesting year-round within 12 miles of the baseline used to measure the territorial sea, except as specified below.

   Rationale -- To prevent conflicts with U.S. fixed gear and small inshore fishing vessels and to prevent catch of localized inshore species important to U.S. commercial and subsistence fishermen. If joint venture operations are permitted, foreign ships receiving fish from American fishermen may operate to within three miles of the baseline used to measure the territorial sea. However, when operating within the area between 3 and 12 miles of the baseline used to measure the territorial sea, such foreign processors may not receive fish from foreign vessels.

2. The area covered by this FMP (or an individual sub-area where a specific catch limit applies) will be closed to all fishermen of a nation for the remainder of the calendar year when that nation's allocation of any species or species group is exceeded, except that such closures will affect longline fishing only if the national allocation of any of the following species is exceeded: sablefish; Pacific cod; and Greenland turbot.

   Rationale -- To discourage foreign fleets from covertly targetting on a species after the allowed catch for it has been taken.

B. Trawl Fishery

1. Area A -- No trawling year-round in the Bristol Bay Pot Sanctuary (as described in Appendix III and Figure 27).

   Rationale -- To prevent conflicts between foreign mobile gear and concentrations of U.S. crab pots; to prevent incidental catch of juvenile halibut which are known to concentrate in this area.

2. Area B -- No trawling from December 1 to May 31 in the Winter Halibut Savings Area (as described in Appendix III and Figure 27).

   Rationale -- To protect winter concentrations of juvenile halibut, and to protect spawning concentrations of pollock and flounders.

3. Area C -- No trawling year-round in the Longline Sanctuary Area (as described in Appendix III and Figure 27).

   Rationale -- To provide a sanctuary for foreign and domestic longline fishing in recognition of the situation in which highly developed trawl fisheries in both the Bering Sea/ Aleutian area and the Gulf of Alaska have tended to preempt grounds from the traditional longline fishing method.

(Prior to 1977, no Danish seiners, side trawlers, or pair trawlers operated in this area, and less than one percent of the foreign stern trawl effort occurred in this area. Because of the displacement of the Japanese land-based dragnet fleet from the Soviet 200-mile zone, that fleet has, since 1977, increased its utilization of the trawl grounds surrounding the Aleutian archipelago. As a result, during the first 7 months of 1978, of the total foreign stern trawl effort in the Bering Sea/Aleutian region, about three percent occurred in this longline sanctuary area.)

4. Area D -- No trawling January 1 - June 30 in the area known as Petrel Bank (as described in Appendix III and Figure 27). Trawling is permitted seaward of three nautical miles from July 1 - December 31.

   Rationale -- To avoid gear conflicts during the conduct of the domestic king crab fishery and to avoid the incidental catch of king crab by trawling. Data available from the fishery in the Petrel Bank area indicate a substantial incidental trawl catch of red, blue and golden king crab. The crab savings effected by the trawl closure is a direct benefit to the domestic fleet by preserving harvestable crabs from the rigors of a trawl effort during the softshell or moulting period.

5. Area E -- No trawling January 1 - April 30 in Area E (as described in Appendix III and Figure 27) EXCEPT trawling is permitted seaward of three nautical miles from May 1 - December 31.

Rationale -- To avoid gear conflicts during the conduct of the domestic king crab fishery and the development of the domestic bottomfish effort and to avoid the adverse effects of the incidental catch of king crabs by trawl.

6. Area F -- Trawling permitted seaward of three nautical miles from the baseline used to measure the U.S. territorial sea in Area F (as described in Appendix III and Figure 27).

7. Area G -- No trawling year-round in Area G (as described in Appendix III and Figure 27).

   Rationale -- To prevent conflicts between foreign mobile gear and concentrations of U.S. crab pots.

C. Longline Fishery

1. Area B -- Winter Halibut Savings Area (as described in Appendix III and Figure 27).
   a. December 1 - May 31 -- no longlining landward of the 500 m isobath.
   b. June 1 - November 30 -- no closures.

   Rationale -- To prevent high incidental catch and mortality of juvenile halibut which are known to occur in winter concentrations in the area.

2. Other areas -- no closures.

3. Throughout the area west of 172-00'W, longlining is permitted seaward of three nautical miles from the baseline used to measure the U.S. territorial sea.

4. Area F -- Longlining permitted seaward of three nautical miles from the baseline used to measure the territorial sea of the United States in Area F (as described in Appendix III and Figure 27).
5. Area G -- Longlining permitted seaward of three nautical miles from the baseline used to measure the U.S. territorial sea in Area G (as described in Appendix III and Figure 27).

D. In-Season Adjustment of Time and Area

The Regional Director or his designee may issue field orders adjusting time and/or area closures for conservation reasons as noted in Section 14.4.3.

The Regional Director or his designee may also issue field orders adjusting time and/or area restrictions on foreign vessels to solve serious gear conflicts with domestic fixed gear fishing operations. The field orders may open or close fishing areas or parts thereof in such gear conflict situations. The criteria for determining the seriousness of the situations as a basis for implementing special in-season time-area closures are:

1. More than two gear loss reports have been submitted in person or by radio to NMFS or the Coast Guard detailing: (a) amount of gear lost; (b) date set and date gear was found missing; (c) observations of foreign vessels operating in area, identified, if possible by call letters; and (d) other pertinent information. Reports of gear loss must be confirmed by affidavit at the earliest opportunity.
2. Foreign vessels are verified by NMFS or the Coast Guard to have been operating in the area of conflict.
3. A Coast Guard or NMFS patrol unit has visited the area and confirmed the general gear conflict situation as indicated by reports.
4. Foreign vessels in the area have been contacted by the patrol unit or by radio message advising of the gear conflict, defining the problem area and requesting that the foreign vessels depart the area voluntarily.
5. Foreign vessels decline to depart the area and domestic fixed gear fishing is continuing and need for specific closure to prevent disruption of domestic fishing is clear.

14.6 Operational Needs and Costs (1000's dollars)

150 observer-months of foreign fishery observer coverage	450 1/
12 observer-months of domestic fishery observer coverage	35
NWAFC allocation compliance analyses	10
NMFS computerized foreign fishery information system	36
NMFS Alaska Regional Office Management Division	435
NOAA/Justice administration of penalties	12
800 Coast Guard ship patrol days	2800
2500 Coast Guard aerial patrol hours	1900
State of Alaska fishery data collection	20
Total	5698

Costs of federal, State, and IPHC biological research are not included inasmuch as they would be financed in the absence of this Fishery Management Plan.

1/ Reimbursed by foreign governments to the U.S. Treasury. Same degree of observer coverage as in 1979. The optimal coverage representing about 20% coverage is 270 observer-months costing $810,000.

8. Add the following to Section 18.0, REFERENCES:

Granfeldt, E. 1979. Marine ecosystems simulation for fisheries management. U.S. Dept. Commerce, NOAA, NMFS, NWAFC processed Report 79-10, Seattle, WA. Unpubl. manuscr.

Laevastu, T. and F. Favorite. 1979. Ecosystem dynamics in the eastern Bering Sea. U.S. Dept. Commerce, NOAA, NMFS, NWAFC, Seattle, WA. unpubl. manuscr.

Otto, R.S., T.M. Armetta, R.A. MacIntosh, and J. McBride. 1979. King and Tanner Crab research in the eastern Bering Sea, 1979. U.S. Dept. of Commerce, NOAA, NMFS, NWAFC, Seattle, WA. Unpubl. manuscr. (Submitted to INPFC)

9. Replace Appendix III with the following:

Appendix III. Specific regulation areas opened or closed to fishing during certain times of the year for some fishing vessels are shown in Figure 27 and defined as follows:

Area A -- Bristol Bay Pot Sanctuary

The portion of the Fishery Conservation Zone encompassed by straight lines connecting the following points, in the order listed:

Cape Sarichef Light (54°36'N - 164°55'42"W)
55°16'N - 166°10'W
56°20'N - 163°00'W
57°10'N - 163°00'W
58°10'N - 160°00'W
Intersection of 160°00'W with the Alaska Peninsula

Area B -- Winter Halibut-savings Area

That portion of the Fishery Conservation Zone encompassed by straight lines connecting the following points, in the order listed:

Cape Sarichef Light (54°36'N - 164°55'42"W)
52°40'N - 170°00'W
55°30'N - 170°00'W
55°30'N - 166°47'W
56°00'N - 167°45'W
56°00'N - 166°00'W
56°30'N - 166°00'W
56°30'N - 163°00'W
56°20'N - 163°00'W
55°16'N - 166°10'W
Cape Sarichef Light (54°36'N - 164°55'42"W)

Area C -- The area between 172-00'W and 178-30'W within the FCZ south of a line drawn to connect the following coordinates:

53°14'N - 172°00'W
52°13'N - 176°00'W
52°00'N - 178°30'W

Area D -- The area known as Petrel Bank on the north side of the Aleutian Islands between the following coordinates:

52°51'N - 178°30'W
51°15'N - 178°30'W
51°15'N - 179°00'E
52°51'N - 179°00'E
52°51'N - 178°30'W

Area E -- The area west of 178°30'W but excluding Area D, known as Petrel Bank that is defined above.

Area F -- The area between three and twelve nautical miles from the baseline used to measure the U.S. territorial sea bounded by 170°30'W and 172°00'W on the north side of the Aleutian Islands and by 170°00'W and 172°00'W on the south side of the Aleutians.

Area G -- The area north of the Aleutian Islands between twelve and three nautical miles from the baseline used to measure the U.S. territorial sea bounded by 170°00'W and 170°30'W.

10. Replace Annex I, Derivation of Acceptable Biological Catch, with Annex I, Amended 81-1, attached.

ANNEX I

DERIVATION OF ACCEPTABLE BIOLOGICAL CATCH

Stock assessment studies based on single species management concepts are reported in this Annex. These studies, leading to determinations of acceptable biological catch (ABC), pertain to the following Bering Sea/ Aleutian groundfish species categories.

I.1 Alaska pollock

I.2 Yellowfin sole

I.3 Turbots (Arrowtooth flounder and Greenland turbot)

I.4 Other flatfishes

I.5 Pacific cod

I.6 Pacific ocean perch and other rockfishes

I.7 Sablefish (Blackcod)

I.8 Atka mackerel

I.9 Squid

1.10 Pacific halibut

I.11 Other included species

A summary of these determinations is given in Table I.1.

The Bering Sea/Aleutians groundfish Management Team has initiated a proposal to manage groundfish stocks based on multi-species or ecosystem concepts. During the evolution of the multi-species concepts and the transition to this management approach, information in this annex based mainly on single species stock assessment studies will be used to manage the stocks. These single species assessments will also serve as guidelines to upper limits of harvest for individual species under multi-species management.

Table I.1--MSY, EY, and ABC values for Groundfish in the Bering Sea/Aleutian Region during 1981 (1000's mt).

Species	Region1/	MSY	EY	ABC	(1979 OY)	(1979 OY - 1981 ABC Change
Pollock	BS	1,100-1,600	1,200	1,200	(1,000)	(+200)
	AL	?	?	100	(100)	(0)
Yellowfin sole	BS-AL	169-260	169	169	(117)	(+52.0)
Turbots	BS-AL	90	71	71	(90)	(-19)
Other flatfishes	BS-AL	42.9-76.8	60	60	(61)	(-1)
Pacific cod	BS-AL	58.7	160	120	(58.7)	(+61.3)
Pacific ocean perch	BS	32	5	1.0	(3.25)	(-2.25)
	AL	75	13	2.6	(7.50)	(-4.9)
Other rockfish	BS	?	7.0	7.0	(7.7)	(+6.6)
	AL	?	7.3	7.3		
Sablefish	BS	11.35	2.6	2.6	(3.5)	(-0.9)
	AL	1.85	1.1	1.1	(1.5)	(-0.4)
Atka mackerel	BS-AL	33	?	24.8	(24.8)	(0)
Squid	BS-AL	≥10	≥10	10	(10)	(0)
Pacific halibut	BS-AL	5	0.3	2/	-	-
Other included species	BS-AL	89.4	89.4	89.4	(74.2)	(+15.2)
Total3/		1,713.2-2,338.1	1,795.4	1,865.8	(1,559.15)	(+306.65)

1/ BS - Eastern Bering Sea (statistical areas I & II).
AL - Aleutian Region (statistical area IV).

2/ Subject to separate FMP.

3/ Excluding Pacific halibut.

I.1 Pollock

I.1.1 Maximum Sustainable Yield

Maximum sustainable yield for pollock has been estimated by two methods: the general production model of Pella and Tomlinson (1969), and the method of Alverson and Pereyra (1969) for obtaining first approximations of yield per exploitable biomass. Estimates thus derived, from data available prior to 1974, ranged from 1.11 to 1.58 million mt (Low, 1974). Incorporation of 1974-76 data, and using the procedure of Rivard and Bledsoe (1977), resulted in an estimated MSY of 1.5 million mt. Annual catches, ranging from 1.59-1.76 million mt in 1971-76 (Table I.2) exceeded estimates of MSY, and declines in relative abundance as shown by fishery statistics indicated that those higher levels of exploitation were not sustainable.

I.1.2. Equilibrium Yield

Relative Abundance

Four procedures as described by Low et al. (1977) have been used for estimating relative abundance (CPUE) of pollock. Although results differ in minor detail between procedures, the CPUE computed by the INPFC workshop procedure (Anon. 1978a) is generally indicative of results from other methods which use fishery statistics (Table I.3).

Table I.2--Annual catch of pollock in the eastern Bering Sea, 1964-78 (metric tons).

Year	Nation				TOTAL
	Japan 1/	U.S.S.R. 2/	R.O.K. 3/	ROC	
1964	174,792				174,792
1965	230,551				230,551
1966	261,678				261,678
1967	550,362				550,362
1968	700,981		1,200		702,181
1969	830,494	27,295	5,000		862,789
1970	1,231,145	20,420	5,000		1,256,555
1971	1,513,923	219,840	10,000		1,743,763
1972	1,651,438	213,896	9,200		1,874,534
1973	1,475,814	280,005	3,100		1,758,919
1974	1,252,777	309,613	26,000		1,588,390
1975	1,136,731	216,567	3,438		1,356,736
1976	913,279	179,212	85,331		1,177,822
1977	868,732	63,467	45,227	944	978,370
1978	821,306	92,714	62,371	3,040	979,424
1979 4/	779,050	60,617	18,230	1,929	943,963

1/ From Japan Fisheries Agency (conservation Areas A, B, C, DE, DW, and E.)
2/ U.S.S.R. trawl fishery east of 180° longitude in the Bering Sea.
3/ Estimates based on U.S. surveillance of R.O.K. fishing activities.
4/ Included 84,137 mt by Poland.

Table I.3--Relative indices of pollock stock abundance in the eastern Bering Sea, 1964-78.

Year	U.S. Procedures		Japanese	INPFC
	Pair Trawl[1]/	Research Vessel[2]/	Procedure[3]/	Workshop Procedure[4]/
1964	9.5	--	--	--
1965	18.3	--	--	--
1966	23.6	--	--	--
1967	21.3	--	--	--
1968	23.8	--	--	194
1969	31.5	--	--	154
1970	18.7	--	--	175
1971	14.2	59.2	--	172
1972	14.2	19.2	--	189
1973	8.6	29.2	12.4	166
1974	10.4	27.5	10.9	118
1975	9.3	21.1	9.5	100
1976	9.4	46.7	9.3	103
1977	8.6	37.7	9.3	98
1978	9.4	33.5	--	105

1/ mt per 1,000 pair trawl horsepower-hours trawled.

2/ kg per 10,000 m^2 in comparative area standardized to catch rates of R/V Oregon.

3/ mt per hour (pair trawl).

4/ expressed as percentage of 1975 pair trawl CPUE.

Results from the INPFC workshop procedure indicate that abundance declined rapidly from 1972 to 1975 and remained at about the lower level through 1978; there was a slight recovery, however, between 1977 and 1978:

Year	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
CPUE	194	154	175	172	189	166	118	100	103	98	105

Japanese scientists, relying on projected CPUE calculations, believe that pollock abundance will continue to increase through 1981 (Okada, et al. 1979). Their calculations show that in relation to 1976, abundance trends should be as follows:

Year	1976	1977	1978	1979	1980	1981
CPUE	100	86	93	113	116	122

Trends in CPUE shown by NMFS trawl surveys have not paralleled those shown by the commercial fishery data (Table I.3). This may be explained by the limited time-area coverage of most of the NMFS surveys and the limited vertical opening (1.7 m) of the trawl used which may not adequately sample the complete water column occupied by pollock. However, large-scale NMFS surveys in 1975 and 1979 which encompassed a large portion of the eastern Bering Sea continental shelf also show relative stability in the abundance of pollock since 1975. Catch rates from comparable areas of the eastern Bering Sea were 80.5 kg/km trawled in 1975 and 77.4 kg/km in 1979.

Absolute Abundance

The absolute abundance of pollock for the entire eastern Bering Sea has been estimated from commercial fishery data using a virtual population analysis (Bakkala et al., 1979).

The analysis shows (Table I.4) that five consecutive strong year-classes entered the fishery during 1970-73 as 3-5 year-olds: the 1965, 1966, 1967, 1968, and 1969 year-classes. They were followed by two weak year-classes (1970 and 1971) which were less than half the strength of previous year-classes. These weak year-classes were then followed by three consecutive stronger year-classes (1972, 1973, and 1974) which contributed to the fishery during 1975-78. The 1975 and 1976 year-classes also appear relatively strong, though not as strong as earlier year-classes.

The effects of large fluctuations in year-class strength are somewhat masked in the total biomass trend, since the population is made up of more than 12 age groups. The exploitable biomass (defined as ages 2-12) peaked at 7.8 million mt in 1972, declined to a low of 5.3 million mt in 1976, and has increased slightly to 6.2 million mt in 1978 (Table 1.4). This trend in biomass is consistent with the trend in CPUE from the commercial fishery. The increase from 1977 to 1978 is largely due to the strength of the 1972-74 year-classes, and to lowered catches in 1977 and 1978.

It is worthy to note that the exploitable biomass of pollock calculated by the virtual population analysis (average of 6.465 million mt for 1970-78) is comparable to the long-term minimum equilibrium biomass (6.444 million mt) calculated by the PROBUB ecosystem model (Granfeldt, 1979). The 1978 biomass (6.244 million mt) is 97% of the long-term minimum equilibrium biomass.

The strength of year-classes as predicted by the cohort analysis is supported by age data from the large-scale NMFS research vessel surveys, of 1975 and 1979 (Figure I.1). The 1979 survey data also provides information on the 1976, 1977, and 1978 year-classes which will form the major part of the exploitable biomass in 1980-82. The 1976 year-class appears less abundant than the 1972 year-class (now known to be a stronger than

Table I.4--Estimated numbers of pollock and biomass of the pollock population in the Bering Sea by virtual population analysis, 1970-78 (analysis with age specific natural mortality).

Population Size in Millions of Fish

Age	1970	1971	1972	1973	1974	1975	1976	1977	1978
2	11,382	10,019	4,502	5,572	15,951	10,704	11,087	9,622	7,261
3	7,363	7,629	6,716	3,018	3,229	8,143	6,603	7,062	5,523
4	4,112	4,935	5,114	4,502	1,411	1,222	2,827	3,027	3,495
5	2,863	2,757	3,308	3,428	1,687	678	617	953	1,131
6	1,289	1,919	1,848	2,218	1,280	771	400	321	317
7	330	864	1,287	1,239	791	663	416	226	143
8	66	221	579	862	443	406	348	219	125
9	46	44	148	388	298	192	219	164	109
10	8	31	30	100	134	97	98	93	80
11	8	6	21	20	44	47	43	39	38
12	4	6	4	14	11	12	26	17	14
Total	27,471	28,431	23,557	21,361	25,279	22,935	22,684	21,743	18,236

Population Biomass in Hundreds of Metric Tons.

Age									
2	9,147	8,052	3,618	4,478	17,224	9,836	9,909	11,246	10,352
3	14,601	15,130	13,319	5,984	8,007	17,948	14,531	18,225	17,649
4	14,025	16,831	17,442	15,354	5,701	4,573	10,746	12,372	18,013
5	13,943	13,423	16,109	16,693	9,320	3,595	3,371	5,205	7,932
6	8,025	11,950	11,505	13,807	8,715	5,207	2,816	2,121	2,730
7	2,450	6,407	9,541	9,185	6,223	5,322	3,505	1,698	1,427
8	557	1,864	4,876	7,261	3,860	3,688	3,349	1,805	1,375
9	428	410	1,372	3,588	2,787	1,916	2,328	1,439	1,291
10	81	308	294	986	1,325	1,032	1,119	854	995
11	90	57	217	208	450	526	519	369	494
12	48	63	40	151	110	139	328	160	182
Total	63,396	74,496	78,332	77,694	63,722	53,782	52,520	55,493	62,440

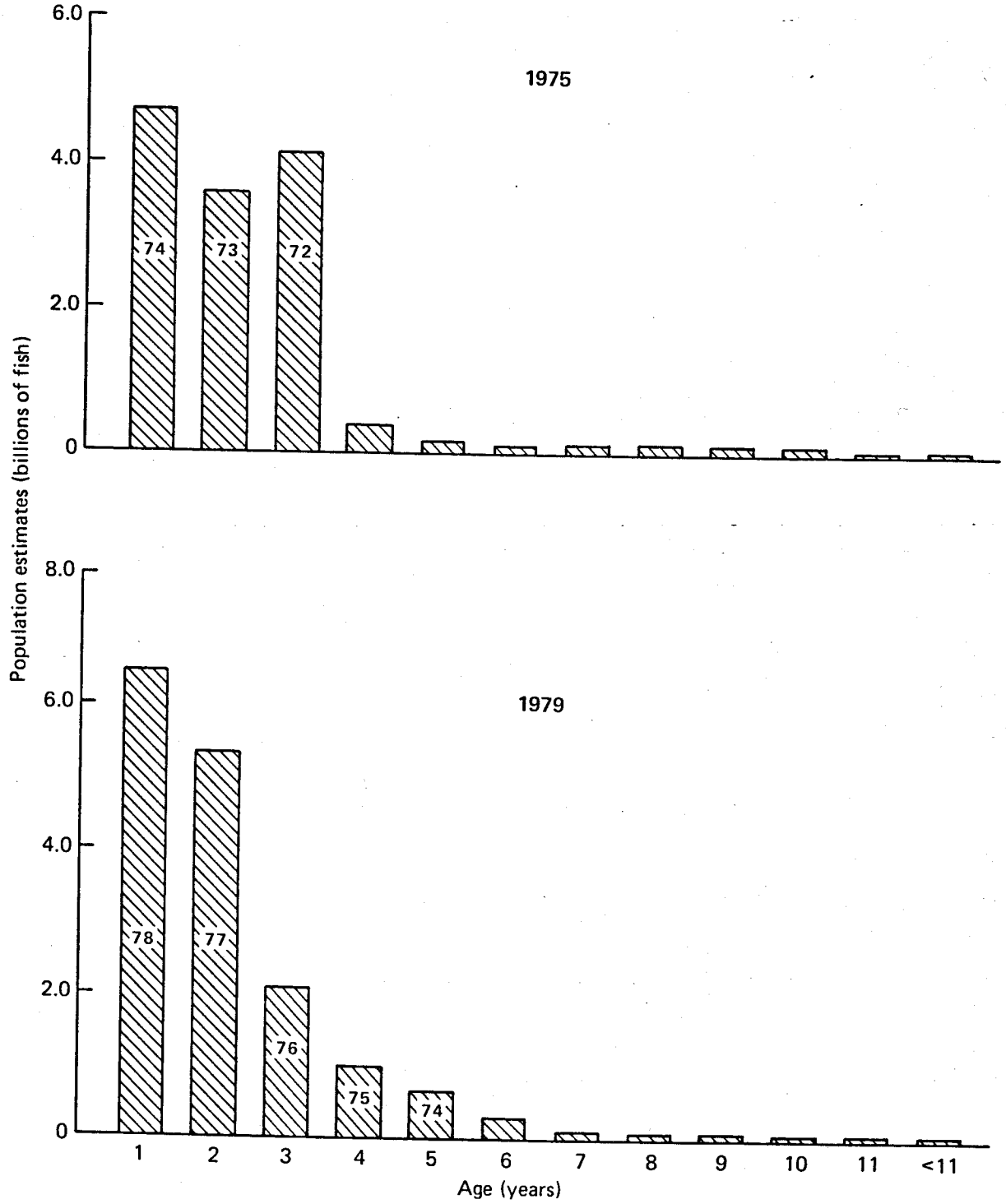


Figure I-1.--Pollock age composition as shown by comprehensive NMFS trawl surveys in 1975 and 1979. Year-classes are shown within bars for certain age groups.

average year-class), but the 1977 and 1978 year-classes appear to be stronger than the 1973 and 1974 year-classes (shown to be relatively strong by the cohort analysis). This comparison suggests that the strength of the 1977 and 1978 year-classes, along with that of other year-classes, should maintain the exploitable biomass of pollock in 1980-81 at least at the 1978 level of 6.2 million mt.

Following the decline in CPUE during 1972-75 when catches ranged from 1.4-1.9 million mt, CPUE stabilized in 1976-78 when catches of about 1 million mt were taken annually. These data suggest that an average catch of about 1 million mt was close to an equilibrium yield during that period.

From a comparison of catches (Table I.2), and biomass estimates from the virtual population analysis (Table I.4), it appears that exploitation rates for pollock since 1970 have been as follows:

Year	1970	1971	1972	1973	1974	1975	1976	1977	1978
Exploitation rate (%)	20	23	24	23	25	25	22	18	16

The data suggest that the average exploitation rate of about 19% during 1976-78 did not reduce the population size and, in fact, allowed some increase in the population biomass during the period of recruitment of the relatively strong 1972-74 year-classes.

The biomass of pollock is expected to remain at least as high as 6.2 million mt in 1980-81 based on the strength of the 1977 and 1978 year-classes that will form the bulk of the exploitable biomass in that period. Based also on the relationship of exploitation rates and stock condition in 1976-78, an exploitation rate of 19% should keep the stock in equilibrium. Current EY is therefore considered to be 0.19 x 6.2 million mt, or 1.20 million mt.

I.1.3 Acceptable Biological Catch

The exploitable pollock biomass has been demonstrably subject to wide fluctuations in abundance caused by naturally induced variations in recruitment. As long as catch is maintained near EY--i.e., not permitted to aggravate a natural decline in abundance leading to an adverse spawner-recruit effect--signficant changes in standing stock will be determined by environmental and ecosystem factors rather than fishing. Even though EY is currently below or near the low end of the MSY range, "rebuilding" to the level of abundance that can produce MSY will have to await natural increases in recruitment. Setting OY 50,000 or 100,000 mt below EY will have little rebuilding effect because: (1) the high rate of natural mortality exhibited by this species will result in only part of that surplus accruing to the standing stock; and (2) at reasonably healthy levels of adult abundance, more spawners will probably not result in any significant enhancement of recruitment three or four years later.

Inasmuch as the decline in abundance noted during the mid-1970's has been arrested and current recruitment appears to be at least of average strength, ABC is considered equivalent to EY--1.20 million mt.

Pelagic Pollock in the Aleutian Basin

Research by the Japan Fishery Agency during the summers of 1977 and 1978 have identified a widely dispersed but substantial quantity of pollock in pelagic waters over the Bering Sea deep-water basin (Nunnallee, 1978; Okada, 1979a; 1979b). Mid-water trawl samples for both day and night tows were used by Nunnallee (1978) to conservatively estimate the biomass of the deep-water population in 1978 at 840,000 mt using the area swept technique ($q = 1.0$). Okada (1979b) using the relationship between echo-gram responses

and night catches of the mid-water trawl and applying this relationship to echo-gram responses from both day and night estimated the biomass of pollock in the deep-water basin to be 4,100,000 mt from 1977 survey data and 5,442,000 mt from 1978 survey data. These pelagic pollock have also been shown to be markedly larger in average size than the pollock on the continental shelf and slope taken by the commercial fishery (Figure I.2).

This difference in size composition leads to the hypothesis that the distribution of pollock changes with size, with the larger individuals tending to a pelagic existence beyond the continental slope and beyond the commercial fisheries as they currently operate.

The discovery of this deep-water component of the Bering Sea pollock population raises questions about the size of the exploitable biomass and estimates of MSY, EY and ABC/OY of the population as a whole.

Assuming that the deep-water and shallow-water pollock, i.e., those available to the commercial fishery, are both components of the same spawning population, and that recruitment to the deep-water component is via the exploited, shallow-water component, three inter-related considerations are germane.

(1) Once recruited to the deep-water component, pollock will no longer be subjected to exploitation by the slope/shelf fishery. Therefore, in any year, abundance of the deep-water component has no direct bearing on the ABC/OY of the exploitable portion of the population. If, however, the commercial fishery develops techniques for harvesting the deep-water component, a separate ABC/OY for that component might be appropriate (subject to consideration of 3, below).

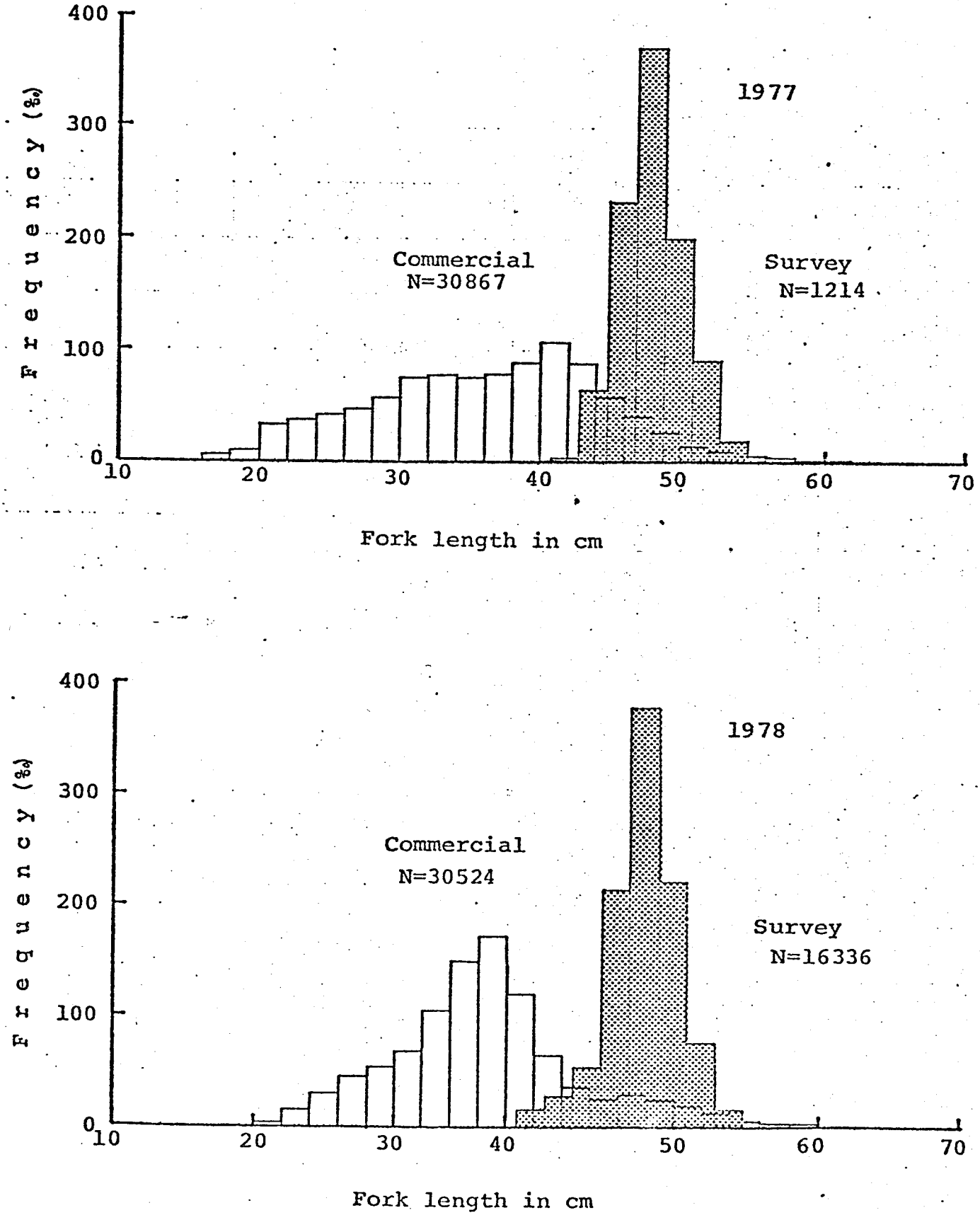


Figure I-2.--Comparison of pollock length distributions in the commercial fishery on the eastern Bering Sea shelf and slope and from research vessel surveys of pelagic pollock over the Bering Sea deep-water basin (from Okada, 1979a).

(2) If, prior to their recruitment to the deep-water component, individual pollock passed through the exploitable portion of the population, a higher fishing rate on the exploitable component might be considered in order to reduce the number of fish which would otherwise survive, move offshore, and be lost to further exploitation (subject to consideration of 3, below).

(3) Although no longer available to the fishery, the deep-water component presumably represents a substantial spawning potential for the population as a whole (especially in light of the exponential increase in fecundity which accompanies increases in length). Maintenance of a deep-water component (by not permitting all of the exploitable component to be taken and by limiting the development of fishing directly on the deep-water component) would seem desirable to assure adequate spawning potential regardless of fluctuations in the abundance of the exploitable component of the population. Such a reproductive "buffer" should allow utilization of the exploitable component without undue concern about the possibility of an adverse spawner-recruit relationship being caused or aggravated by the shelf/slope fishery.

Until: (1) it has been determined that the deep-water pollock are, in fact, a component of the same population which is exploited (at younger ages) over the continental shelf and slope; (2) it is clear that the deep-water component is made up only of older fish that are no longer available to the slope/shelf fishery; and (3) an empirically-derived model has been developed in which the relation between slope/shelf exploitation and abundance of the deep-water component can be demonstrated, the only change that will be considered in the Bering Sea pollock ABC/OY because of the

discovery of the deep-water component is that of a separate ABC/OY for fishing in deep water.

In addition to the 1,200,000 mt ABC/OY for pollock in the traditional fishing areas where pollock are taken near bottom, a separate ABC/OY of 100,000 mt is designated for pollock in pelagic waters in deep-sea zones of more than 1,000 m. To simplify management regulations associated with these ocean depths, ABC is set at 1,200,000 mt for Bering Sea statistical Areas I and II (see Figure I.3 for location of statistical areas) combined, and at 100,000 mt for statistical Areas III and IV, combined. This ABC of 100,000 mt in Areas III and IV is provided to encourage exploratory or experimental fishing operation in the pelagic fishing zone. It would provide a substantial but controlled opportunity to expand the pollock fishery to an apparently unused segment of the population, and, if utilized, will produce further information about the deep-water component that can be used for future population evaluations and management decisions.[1]/

1/ Records of the Japanese research survey which identified the deep-water component of the pollock population showed highest concentrations within 50-150 miles of the Aleutian chain in water depths greater than 1,000 m. Most of that described region lies within statistical Area IV.

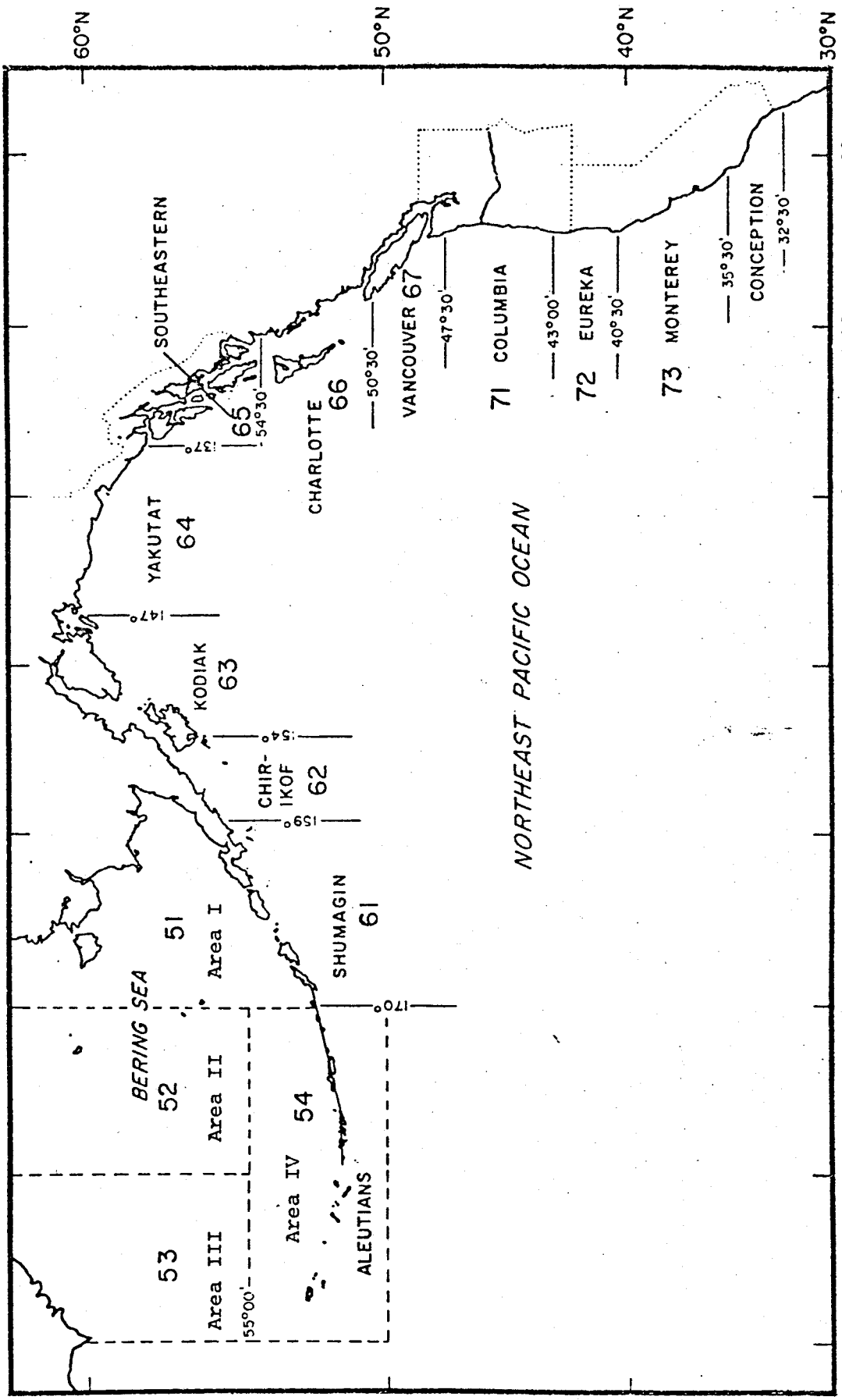


Figure I-3--U.S. statistical areas in the Bering Sea and northeastern Pacific Ocean.

I.2 Yellowfin sole

I.2.1 Maximum Sustainable Yield

Annual catches of yellowfin sole in the eastern Bering Sea given in Table I.5 can be summarized as follows:

Period	Number of years	Range in annual catches (mt)	Average annual catch (mt)
1954-58	5	12,562 - 44,153	24,049
1959-62	4	185,321 - 553,742	403,967
1963-68	6	53,810 - 162,228	99,928
1969-71	3	133,079 - 167,134	153,537
1972-77	6	42,235 - 78,240	57,950
1978-79	2	101,108 -138,433	119,770

Catches in the period of 1972-77 were relatively low due primarily to the absence of directed fishery for yellowfin sole by the U.S.S.R. The U.S.S.R. re-entered the yellowfin sole fishery in 1978-79, and catches more than doubled over the average annual levels of 1972-77.

Prior to 1963, virgin or near virgin biomass was estimated to be 1.3 to 2 million mt (Alverson and Pereyra, 1969; Wakabayashi, 1975). Applying the yield equation of Alverson and Pereyra (1969) (MSY - 0.5 MB_o, where B_o = virgin biomass and M = natural mortality) to the pre-1963 biomass estimate results in the following approximation:

MSY = 0.5 x 0.26 x 1,300,000 to 2,000,000 = 169,000 to 260,000 mt.

TABLE I-5 . -- ANNUAL CATCHES OF YELLOWFIN SOLE IN THE EASTERN BERING SEA (EAST OF 180 AND NORTH OF 54N) IN METRIC TONS. A/

YEAR	JAPAN	USSR	ROK	TOTAL
1954	12,562	0	0	12,562
1955	14,690	0	0	14,690
1956	24,697	0	0	24,697
1957	24,145	0	0	24,145
1958	39,153	5,000	0	44,153
1959	123,121	62,200	0	185,321
1960	360,103	96,000	0	456,103
1961	399,542	154,200	0	553,742
1962	281,103	139,600	0	420,703
1963	20,504	65,306	0	85,810
1964	48,880	62,297	0	111,177
1965	26,039	27,771	0	53,810
1966	45,423	56,930	0	102,353
1967	60,429	101,799	0	162,228
1968	40,834	43,355	-	84,189
1969	81,449	85,685	-	167,134
1970	59,851	73,228	-	133,079
1971	82,179	78,220	-	160,399
1972	34,846	13,010	-	47,856
1973	75,724	2,516	-	78,240
1974	37,947	4,288	-	42,235
1975	59,715	4,975	-	64,690
1976	52,666	2,908	625	56,201
1977	58,090	283	-	58,373
1978	62,064	76,300	69	138,433
1979 B/	58,490	41,259	1356	101,108

A/ SOURCE: WAKABAUSHI AND BAKKALA (1978) FOR CATCHES THROUGH 1976; CATCH DATA FOR 1977 AND 1978 FROM DATA ON FILE, NORTHWEST AND ALASKA FISHERIES CENTER, SEATTLE, WA.

B/ INCLUDES 3MT BY TAIWAN

I.2.2 Equilibrium Yield

Relative Abundance

The two sources of information used to examine trends in relative abundance for yellowfin sole are pair trawl data from the Japanese commercial fishery and U.S. research vessel data from a comparative area (Bakkala et al., 1979) fished since 1973. The pair trawl catch and effort data used are those from 1^{o} longitude by $1/2^{o}$ latitude statistical blocks and months in which yellowfin sole made up 50% or more of the total catch. Effort data is adjusted for changes in horsepower. CPUE values are calculated for two time periods, September-December and September-March. The first period represents the first half of the winter fishing season, and the second period the full winter fishing season. Because catch and effort data are reported by calendar year, the use of first-half season data allows trends in CPUE to be examined for one additional season compared to full-season data. Trends in first-half and full-season data are much the same.

The Japanese pair trawl data show a substantial increase in relative abundance of yellowfin sole between 1972 and 1977 (Figure I-4). Changes in fishing strategy between the 1973-74 and 1974-75 fishing seasons which increased the efficiency of the fleet (Bakkala et al., 1979) may have accounted for part of the increase between those seasons. First-half season data show a decline in CPUE in September-December 1978 from that in 1977. The 1978 CPUE, however, exceeded all other values since 1970 with the exception of the 1977 value.

U.S. research vessel data also show abundance of yellowfin sole increasing since 1973 (Figure I-4). The trend line is broken between 1976 and 1977 because a gear change was made in 1977 (Bakkala et al., 1979) and the influence of this change on the catchability of yellowfin

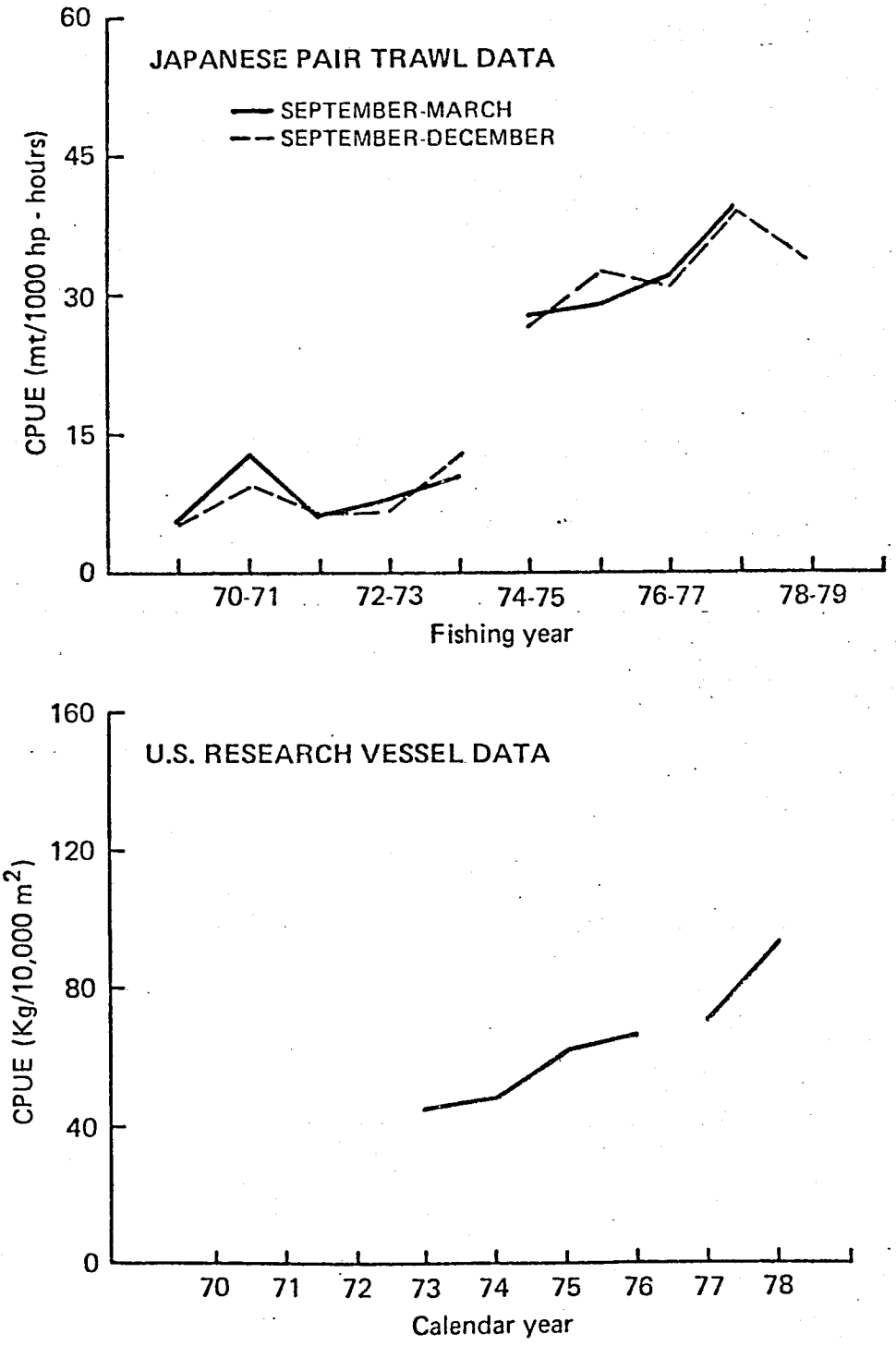


Figure I-4.--Relative abundance of yellowfin sole as shown by Japanese pair trawl data and by U.S. research vessel surveys. Breaks in the trend lines indicate changes in fishing gear or fishing techniques (see text). (from Bakkala et al., 1979).

sole is uncertain. Nevertheless, increases in abundance were shown by the old gear from 1973 to 1976, and by the new gear between 1977 and 1978.

Absolute Abundance

Biomass estimates based on the area-swept technique have been calculated from NMFS research vessel surveys since 1973. Surveys in most years have been limited to the southeastern Bering Sea. However, larger-scale surveys which sampled major portions of the eastern Bering Sea continental shelf were conducted in 1975, 1976, 1978, and 1979. Biomass estimates (mt) from these larger surveys, and 95% confidence intervals around the mean estimates are as follows:

Year	Mean Estimate	95% Confidence Interval
1975	1,038,400	870,800 - 1,206,400
1976	1,192,624	661,690 - 1,723,558
1978	1,523,429	1,103,294 - 1,943,564
1979	1,932,558	1,668,984 - 2,196,133

Like the CPUE trends, the biomass estimates show a substantial increase in abundance of yellowfin sole. This increase can be mainly attributed to a series of strong year-classes (the 1966-70 year-classes) which were recruited to the exploitable portion of the population in the mid-and late 1970's. Figure I.5 illustrates the progression of these year-classes into the exploitable population, and the accumulative affect of this recruitment on the total exploitable stock size through 1978.

The 1966-70 year-classes are now reaching an age (10 years and older) when natural mortality will have begun to substantially reduce their abundance. Moreover, the 1971 and 1972 year-classes appear less abundant than the

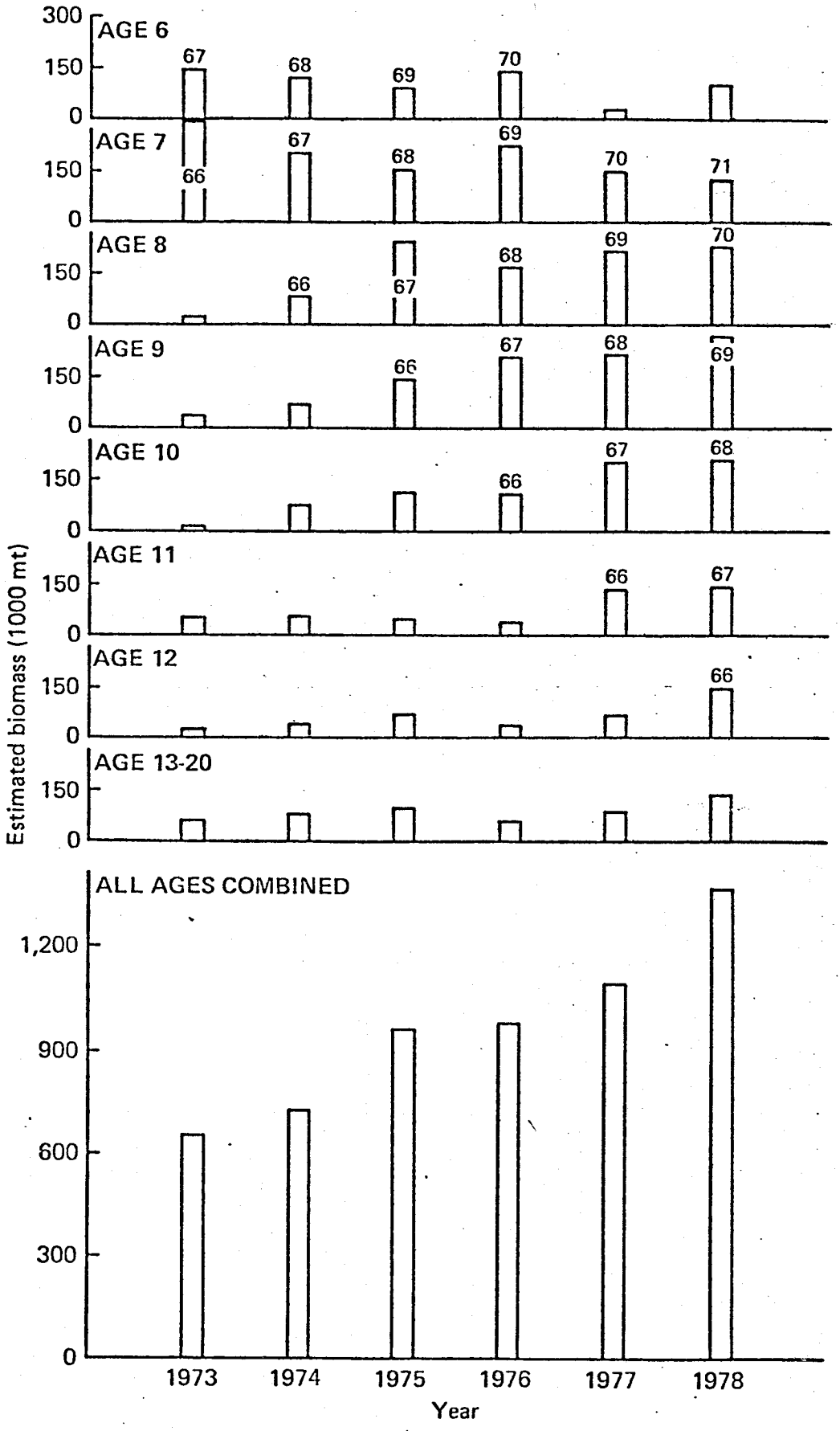


Figure I-5.-Biomass estimates for the exploitable population of yellowfin sole in the southeast Bering Sea. Year-classes for certain ages are shown with appropriate bars.

1966-70 year-classes, although the 1973 year-class appears relatively strong. Based on these considerations, the abundance of yellowfin sole would be expected to level off or even decline. The substantial increase in biomass as shown by the NMFS surveys between 1978 and 1979 was therefore unexpected. The 1979 survey more comprehensively sampled the eastern Bering Sea shelf than did the 1978 survey, and this greater coverage may be the principal reason for the large estimate in 1979. Nevertheless, biomass estimates for two consecutive years (the 1978 and 1979 surveys) indicate that yellowfin sole have recovered to a point where abundance falls within the estimated range of the virgin biomass (1.3 - 2.0 million mt). Consequently, EY is currently considered equivalent to at least the lower end of the MSY range or 169,000 mt.

1.2.3 Acceptable Biological Catch

This resource has recovered surprisingly well from a state of depletion in the mid-1960's. Current abundance is high and approximates estimates of virgin biomass. Accordingly, ABC is considered equivalent to EY--169,000 mt.

1.3 Turbots (Arrowtooth flounder and Greenland turbot)

The turbots (arrowtooth flounder and Greenland turbot) are large flatfishes which are distributed along the continental slope in deep water as adults; juvenile stages mainly occupy the continental shelf. By virtue of their biology and bathymetric distribution, the turbots are largely separated from the small flounders in the Bering Sea. Furthermore, the target fishery for turbots is quite distinct from that for other flounders. The turbot complex is, therefore, managed as an independent unit.

I.3.1 Maximum Sustainable Yield

After a long period of relatively small catches, turbot production in the eastern Bering Sea and Aleutians increased substantially in the early 1970's and reached about 103,000 mt in 1973 and 1974 (Table I-6). Since 1974, catches have declined and were 52,000 mt in 1978. Of the two species in this complex, Greenland turbot has accounted for 80% of the catch.

Since turbots are secondary or only occasional target species taken in the fisheries for pollock, sablefish, and yellowfin sole, it is difficult to estimate the MSY of this complex with standard production models which rely on commercial catch-effort statistics.

Although catches averaging 94,000 mt were sustained in the eastern Bering Sea and Aleutians during the period 1972-76, catch rates of Greenland turbot in the Japenese landbased trawl fleet decreased substantially during this period (see section 1.3.2, following). Accordingly, MSY for the turbot complex for the eastern Bering Sea and Aleutians is believed to be no more than 90,000 mt.

Table I-6.--Foreign calendar year catches (mt) of arrowtooth flounder and greenland turbot by area and nation, 1960-78.

Year	Eastern Bering Sea (east of 180°)					Aleutian Island Area					E. Bering Sea and Aleutian Combined Total
	Japan		USSR	ROK	Total	Japan		USSR	ROK	Total	
	MS	LG-NPT[a]/ LBD[b]/				MS	LG NPT LBD				
ARROWTOOTH FLOUNDER AND GREENLAND TURBOT COMBINED.											
1960	36,843	-	-		36,843	-	-	-		-	36,843
1961	57,348	-	-		57,348	-	-	-		-	57,348
1962	58,226	-	-		58,226	-	-	-		-	58,226
1963	31,565	-	-		31,565	-	7	-		7	31,572
1964	33,726	3	-		33,729	475	29	-		504	34,233
1965	7,648	299	1,800		9,747	299	1	-		300	10,047
1966	10,752	90	2,200		13,042	63	0	-	-	63	13,105
1967	20,574	656	2,639	-	23,869	167	227	-		394	24,263
1968	17,702	2,278	15,252	-	35,232	106	107	-	-	213	35,445
1969	13,525	5,706	16,798	-	36,029	51	177	-	-	228	36,257
1970	14,212	9,857	8,220	-	32,289	278	281	-	-	559	32,848
1971	29,313	12,483	17,460	-	59,256	1,329	1,002	-	-	2,331	61,587
1972	25,949	27,687	23,998	-	77,634	900	13,030	267	-	14,197	91,831
1973	31,082	43,354	16,214	-	90,650	1,478	10,531	362	-	12,371	103,021
1974	38,824	22,833	29,470	-	91,127	2,281	9,663	39	-	11,983	103,110
1975	32,382	21,484	31,785	-	85,651	926	2,685	143	-	3,754	89,405
1976	34,221	19,109	24,999	-	78,329	933	2,392	112	-	3,437	81,766
1977	16,375	15,454	5,333	-	37,162	640	3,824	24	-	4,488	41,650
1978	21,299	20,244	4,119	119	45,781	1,182	5,363	2	1	6,548	52,329

Table I-6.--Foreign calendar year catches (mt) of arrowtooth flounder and greenland turbot by area and nation, 1960-78 (continued).

Year	Eastern Bering Sea (east of 180°)					Aleutian Island Area					E. Bering Sea and Aleutian Combined Total
	Japan		USSR	ROK	Total	Japan		USSR	ROK	Total	
	MS	LG-NPT[a]/ LBD[b]/				MS	LG NPT LBD				
ARROWTOOTH FLOUNDER											
1970	9,047	307	3,244	-	12,598	274	0	-	-	274	12,872
1971	6,235	5,368	7,189	-	18,792	44	537	-	-	581	19,373
1972	1,261	2,562	9,300	-	13,124	194	1,023	106	-	1,323	14,447
1973	1,915	3,014	4,288	-	9,217	483	3,199	23	-	3,705	12,922
1974	1,221	1,602	18,650	-	21,473	1,378	1,817	0	-	3,195	24,668
1975	330	911	19,591	-	20,832	115	526	143	-	784	21,616
1976	139	1,535	16,132	-	17,806	96	1,274	-	-	1,370	19,176
1977	4,000	2,160	3,294	-	9,454	158	1,857	20	-	2,035	11,489
1978	4,598	1,093	2,576	91	8,358	524	1,256	2	0	1,782	10,140
GREENLAND TURBOT											
1970	5,165	9,550	4,976	-	19,691	4	281	-	-	285	19,976
1971	23,078	7,115	10,271	-	40,464	1,285	465	-	-	1,750	42,214
1972	24,688	25,125	14,697	-	64,510	706	12,007	161	-	12,874	77,384
1973	29,167	14,187	11,926	-	55,280	995	7,332	339	-	8,666	63,946
1974	37,603	21,231	10,820	-	69,654	903	7,846	39	-	8,788	78,442
1975	32,052	20,573	12,194	-	64,819	811	2,159	0	-	2,970	67,789
1976	34,082	17,574	8,867	-	60,523	837	1,118	112	-	2,067	62,590
1977	12,375	13.294	2,039	-	27,708	482	1,967	4	-	2,453	30,161
1978	16,701	19,151	1,543	28	37,423	658	4,107	0	1	4,766	42,189

a/ Mothership, North Pacific longline.
b/ Landbased dragnet trawl fishery.

1.3.2 Equilibrium Yield

Annual NMFS research vessel surveys in the southeastern Bering Sea only sample the juvenile populations of the two species and inadequately cover the range of Greenland turbot. Catch rates in the survey area have been relatively stable for Greenland turbot and have increased for arrowtooth flounder indicating that fishery removals have not impacted the recruitment of these species within the annual NMFS survey area (Bakkala et al., 1979). Catch-effort data from the Japanese landbased trawl fishery indicates that abundance of Greenland turbot declined substantially during 1972-76 when catches of this species averaged about 70,000 mt annually. The CPUE was relatively stable during 1976-78 when catches of Greenland turbot averaged about 45,000 mt annually. Fishery data is inadequate for assessing adult arrowtooth flounder because they are only an incidental part of the catch although there has been no indication of a decline in abundance of this species. Other evidence bearing on the condition of these resources comes from the large-scale NMFS surveys in the eastern Bering Sea in 1975 and 1979. Biomass estimates (mt) from the area surveyed in 1975 from the two years were as follows:

Species	1975	1979
Arrowtooth flounder	28,000	42,000
Greenland turbot	126,700	143,300
Total	154,700	185,300

These estimates suggest some increase in abundance, although not a substantial increase. Evidence from fishery and research vessel data are, therefore, supportive in indicating relative stability of this species group between

1975 and 1979. Consequently, the present EY for Greenland turbot is considered equivalent to the average annual catch during 1975-78 of 51,000 mt. The EY for arrowtooth flounder is considered equivalent to 20,000 mt since catches of this magnitude have produced no indication of a decline in abundance. The combined EY for this species group is, therefore, 71,000 mt.

I.3.3 Acceptable Biological CAtch

ABC for the turbot complex is considered equivalent to EY--71,000 mt.

I.4 Other Flatfishes

The species complex is made up of the following small flatfish which have distributions that are almost entirely restricted to waters of the continental shelf: flathead sole, rock sole, Alaska plaice, and small amounts of rex sole, Dover sole, starry flounder, longhead dab, and butter sole. Catches of these species are almost entirely from the eastern Bering Sea with only trace amounts taken in the Aleutians (Table I-7). All-nation catches of these species in the eastern Bering Sea and Aleutians were relatively stable in the 1960's, ranging around 30,000 mt, but increased to about 92,000 mt in 1971. At least part of this increase is due to better species identification and reporting of catches in the 1970's. After 1971, catches declined to about 16,000 mt in 1977, but increased to 30,000 mt in 1978. Because these species are a by-catch of target fisheries for other species, the decline in catches are thought to be mainly a function of changes in fishing effort for target species, particularly yellowfin sole. The absence of a U.S.S.R. target fishery for yellowfin sole from 1973-77 may be the primary cause of the relatively low catches of "other flatfish" in this period.

Table I-7.--All-nation catches of other flatfishes in the eastern Bering Sea and Aleutian Island area in metric tons.

	E. Bering Sea (east of 1800-INPFC areas 1 & 2)				Aleutians (INPFC area 5)				Total - all areas			
Year	Rock Sole	Flathead Sole	Alaska Plaice	Total	Rock Sole	Flathead Sole	Alaska Plaice	Total	Rock Sole	Flathead Sole	Alaska Plaice	Total
1963	5,002	29,625	975	35,602	27	14	--	14	5,029	29,639	975	35,643
1964	3,238	25,288	1,838	30,364	152	43	45	240	3,390	25,331	1,883	30,604
1965	3,678	6,713	979	11,370	147	128	41	316	3,825	6,841	1,020	11,686
1966	9,104	11,020	4,633	24,757	82	25	--	107	9,186	11,045	4,633	24,864
1967	4,762	23,437	3,853	32,052	25	32	--	57	4,787	23,469	3,853	32,109
1968	5,250	21,575	2,619	29,444	17	186	--	203	5,267	21,761	2,619	29,647
1969	9,240	18,563	6,942	34,745	2	2	--	4	9,242	18,565	6,942	34,749
1970	20,123	41,152	3,402	64,677	2	11	--	13	20,125	41,163	3,402	64,690
1971	40,419	51,024	992	92,435	1	16	--	17	40,420	51,040	992	92,452
1972	60,824	15,690	290	76,304	5	4	--	9	60,829	15,694	290	76,813
1973	23,835	18,141	1,917	43,893	2	24	--	26	23,837	18,165	1,917	43,919
1974	19,975	14,917	2,388	37,280	36	41	--	77	20,011	14,958	2,388	37,357
1975	12,011	5,887	2,491	20,389	3	1	--	4	12,014	5,888	2,491	20,393
1976	9,940	8,155	3,620	21,715	24	7	--	31	9,964	8,162	3,620	21,746
1977	5,200	7,547	3,119	15,866	119	39	0	158	5,319	7,586	3,119	16,024
1978	6,224	14,363	9,467	30,054	814	240	1	1,055	7,038	14,603	9,468	31,109

Source: 1963-76 statistics -- Wakabayashi and Bakkala, 1978; 1977-78 statistics -- Data on File, Northwest and Alaska Fisheries Center, Seattle, WA.

Winter closed areas in the southeastern Bering Sea for the protection of Pacific halibut may have also contributed to the decline in catches of flounders.

I.4.1 Maximum Sustainable Yield

By assuming that the complex had been fully utilized prior to 1975, the average catch (42,900 mt) in 1963-74 for the eastern Bering Sea and Aleutians should approximate MSY. Furthermore, if the complex had been fully utilized prior to 1975, the Schaefer model indicates that by 1975 biomass would be about half of its virgin level. A NMFS trawl survey in 1975 (swept area technique) indicated a standing stock of 232,200-334,100 mt of flathead and rock sole (Table I-8) implying a virgin biomass of 462,400-668,200 mt. Inasmuch as Alaska plaice are virtually unutilized by the fisheries, they are excluded from the following computations. If m = 0.23 for this complex (Section 9.1; flathead sole 0.2, rock sole 0.26), the Alverson-Pereyra yield equation produces an estimate of MSY of 53,200-76,800 mt (0.5 x 0.23 x 462,400-668,200).

Therefore, estimates of MSY range from a low of 42,900 to 76,800 mt (the high end of the above range).

Table I-8.--Estimated biomass of the "other flatfish" complex in the eastern Bering Sea from NMFS research surveys in 1975 and 1979.

Species	Mean Estimates (mt) 1975	Mean Estimates (mt) 1979[1]/	95% Confidence Limits (mt) 1975	95% Confidence Limits (mt) 1979
Rock sole	170,300	182,800	138,300-202,000	137,400-228,200
Flathead sole	113,000	101,800	93,900-132,100	79,300-124,400
Alaska plaice	127,100	283,000	101,800-152,800	197,700-368,170
Total	410,400	567,600	---	---

1/ The 1979 survey covered a larger area than the 1975 survey, but the 1979 estimates are only from the area surveyed in 1975.

I.4.2 Equilibrium Yield

An evaluation of the condition of the "other flatfish" resource based on survey data through 1978 indicated that there may have been a decline in abundance of these species between 1975 and 1978 because of below average strength of the 1971 and 1972 year-classes of rock sole and flathead sole (Bakkala et al., 1979). Biomass estimates from the large-scale NMFS research vessel survey in 1979, however, indicate that there has been little or no change in the combined biomass of rock sole and flathead sole between 1975 and 1979 (Table I-8). Moreover, there has been an apparent increase in abundance of Alaska plaice between 1975 and 1979. The "other flatfish" resource is, therefore, considered to be in satisfactory condition, and the mid-point of the estimated MSY range (60,000 mt) is believed to be attainable.

I.4.3 Acceptable Biological Catch

This species complex appears to be in satisfactory condition and Alaska plaice, which is now the single most abundant species in the complex, are yet to come under full utilization. ABC is therefore considered equivalent to the mid-point of the MSY range--60,000 mt.

I.5 Pacific Cod

I.5.1 Maximum Sustainable Yield

Pacific cod are distributed widely over the Bering Sea continental shelf and slope, and have a distributional pattern similar to that of pollock. During the early 1960's, when a fairly large Japanese longline fishery operated on the continental slope, cod were harvested by longliners for the frozen fish market. Beginning in 1964, the Japanese North Pacific trawl fishery for pollock expanded, and cod became an important incidental catch in the pollock fishery. At present, cod are believed to be an occasional target species when high concentrations are detected during pollock fishing operations.

The annual catch of Pacific cod by all foreign nations in the eastern Bering Sea and Aleutians increased from 13,600 mt in 1964, to about 70,400 mt in 1970; since then, catches have varied between 36,600 and 63,800 mt (Table I-9). Japan has accounted for 66-99% of the catch since the U.S.S.R. began reporting their catches of cod in 1971.

Table I-9.--Foreign calendar year catches (mt) of Pacific cod by area and nation, 1964-78.

Year	Eastern Bering Sea						Aleutian Island Area					E. Bering Sea and Aleutian Comb.Total
	Japan		USSR	ROK[c/]	ROC[d/]	Total	Japan		USSR	ROK	Total	
	MS-LG-NPT[a/]	LBD[b/]					MS-LG-NPT	LBD				
1964	13,408	-	-			13,408	241	-	-		241	13,649
1965	13,524	1,195	-			14,719	414	37	-		451	15,170
1966	17,178	1,022	-			18,200	103	51	-		154	18,354
1967	30,502	1,562	-	-		32,064	153	140	-	-	293	32,357
1968	52,135	5,767	-	-		57,902	121	168	-	-	289	58,191
1969	44,871	5,480	-	-		50,351	204	16	-	-	220	50,571
1970	61,015	9,079	-	-		70,094	221	62	-	-	283	70,377
1971	32,206	8,362	2,486	-		43,054	263	162	1,653	-	2,078	45,132
1972	33,715	2,162	7,028	-		42,905	233	202	-	-	435	43,340
1973	38,137	2,680	12,569	-		53,386	295	271	411	-	977	54,363
1974	42,741	3,174	16,547	-	-	62,462	651	683	45	-	1,379	63,841
1975	32,092	1,230	18,229	-	-	51,551	2,470	111	257	-	2,838	54,389
1976	29,627	2,382	17,756	716	-	50,481	3,688	174	312	16	4,190	54,671
1977	29,682	3,459	177	-	2	33,320	1,533	1,629	100	-	3,262	36,582
1978	36,513	4,721	419	859	-	42,512	1,460	1,705	120	6	3,291	45,803

a/ Mothership, North Pacific longline, and North Pacific trawl fisheries.

b/ Landbased dragnet fishery.

The incidental occurrence of cod in foreign trawl catches makes questionable the use of CPUE trends from the commercial fishery. Moreover, the semi-demersal distribution of cod makes them difficult to assess with research vessel trawls. MSY for this species has, therefore, been estimated on the basis of commercial catch data. Because catches increased rapidly in the mid-1960's and then stabilized, the average catch during this period of stability (1968-76) was assumed to reflect at least a minimal estimate of MSY. The original estimate was 58,700 mt, but this figure includes catches from west of 180° which lies outside the U.S. FCZ. A more appropriate estimate, including only those catches within the FCZ from the eastern Bering Sea (east of 180°) and Aleutian Islands area, is 55,000 mt.

I.5.2 Equilibrium Yield

Accumulating evidence since 1978 indicates that the abundance of Pacific cod is increasing and that this increase may be substantial. The relative abundance of cod more than doubled between 1976 and 1978 based on NMFS research survey data, and in 1978 there appeared to be unusually high abundance of age 0 and age 1 cod (year-classes 1977 and 1978) in the research vessel catches (Bakkala et al., 1979). These year-classes as age 1 and age 2 fish were also abundant in research vessel catches during the large-scale survey of the eastern Bering Sea in 1979. Based on data from the large-scale OCSEAP survey in 1975 and using data from an equivalent area in 1979 indicates that the CPUE of cod apparently increased by a factor of approximately 7 between 1975 (2.7 kg/km) and 1979 (19.8 kg/km).

Age data from the commercial fishery indicates that the abundance of a cod cohort peaks in the fishery at age 3, contributes substantially to catches at age 4, but that abundance declines sharply at ages 5 and 6. The 1977 and 1978 year-classes will, therefore, make their greatest contribution to the fishery in 1980-82.

The estimated biomass of cod from the 1979 survey was 792,300 mt with a 95% confidence interval of 603,200-981,400 mt. About 81% of the total biomass was made up of age groups 1 and 2 which are only partially recruited to the fishery.

Using population estimates by age from the 1979 NMFS survey, historical growth rates, a range in instantaneous natural mortality rates of 0.5-0.7, and various possible fishing mortalities by age, the projected biomass of cod in 1980 and 1981 has been calculated. These projections indicate that the exploitable biomass (age group 2-5) in 1980 and 1981 may fall within the following ranges:

Year	Predicted Range in Biomass (mt)
1980	740,000-910,000
1981	803,000-1,248,000

Conservatively using the lower end of the projected range in biomass and an exploitation rate of 20%, the estimated EY is 148,000 mt in 1980 and 160,000 mt in 1981.

I.5.3 Acceptable Biological Catch

ABC will exceed estimates of MSY in 1981 due to the recruitment of the strong 1977 and 1978 year-classes. Since natural mortality will rapidly reduce the abundance of these year-classes after age 4, it is prudent to harvest the 1977 and 1978 year-classes during the short period they remain in the fishery. However, due to the possible inaccuracies in the 1979 biomass estimate and in the projections of this estimate to 1980-81, ABC is set at 75% of the projected EY for 1981--0.75 x 160,000 = 120,000 mt.

I.6 Pacific Ocean Perch and Other Rockfishes

I.6.1 Maximum Sustainable Yield

Pacific Ocean Perch

Pacific ocean perch is the most abundant rockfish species in the North Pacific Ocean. Chikuni (1975) identified two main stocks in the Bering Sea: an Eastern Slope stock in the southeastern Bering Sea, and an Aleutian stock distributed along both sides of the Aleutian Islands. Commercial catch statistics (Table I-10) indicate that the Aleutian stock is much larger than that of the Eastern Bering Sea Slope. Catches peaked at about 47,000 mt in the Eastern Slope Region in 1961, whereas they peaked at 109,000 mt in the Aleutian Region in 1965. Since then, catches have declined drastically in both regions. This decline is attributed mainly to lower stock abundance caused by the removal of larger, older fish.

Under ideal resource conditions, MSY has been estimated to be as high as 32,000 mt in the eastern Bering Sea and as high as 75,000 mt in the Aleutians (Chikuni 1975). However, an examination of catch statistics show that sustained exploitation of this magnitude was not possible. Low (1974), using a general production model, estimated the MSY of Pacific ocean perch for the eastern Bering Sea and Aleutians combined as 12,000-17,000 mt.

Other Rockfish

Ikeda (1979) has used Japanese research vessel data to estimate the biomass and MSY for "other rockfish" as follows:

Area	Estimated Biomass (mt)	Estimated Range in MSY (mt)
Eastern Bering Sea	55,000	7,000-15,000
Aleutians	167,000	23,000-45,000

In making these estimates, Ikeda (1979) had limited survey data to work with and used a number of assumptions which need verification. These estimates can therefore only be used as first approximations

TABLE I-10.--ANNUAL CATCH OF PACIFIC OCEAN PERCH IN THE BERING SEA IN THOUSAND METRIC TONS.

	JAPAN A/			U.S.S.R. B/			TOTAL		
YEAR	EASTERN SLOPE	ALEUTIAN	TOTAL	EASTERN SLOPE	ALEUTIAN	TOTAL	EASTERN SLOPE	ALEUTIAN	TOTAL
1950	1.1	----	1.1	5.0	----	5.0	6.1	----	6.1
1951	13.0	----	13.0	34.0	----	34.0	47.0	----	47.0
1962	12.9	0.2	13.1	7.0	----	7.0	19.9	0.2	20.1
1963	17.5	0.8	18.3	7.0	20.0	27.0	24.5	20.8	45.3
1964	14.4	29.3	43.7	11.5	61.0	72.5	25.9	90.3	116.2
1965	7.8	38.1	45.9	9.0	71.0	80.0	16.8	109.1	125.9
1966	17.5	28.2	45.7	2.7	57.7	60.4	20.2	85.9	106.1
1967	19.6	9.3	28.9	----	46.6	46.6	19.6	55.9	75.5
1968	28.4	18.3	46.7	3.1	26.6	29.7	31.5	44.9	76.4
1969	14.5	15.6	30.1	0.0	23.2	23.2	14.5	38.8	53.3
1970	9.9	13.6	23.5	0.0	53.3	53.3	9.9	66.9	76.8
1971	9.8	14.6	24.4	0.0	7.2	7.2	9.8	21.8	31.6
1972	5.5	8.6	14.1	0.2	24.6	24.8	5.7	33.2	38.9
1973	2.7	9.3	12.0	1.0	2.5	3.5	3.7	11.8	15.5
1974	6.6	21.7	28.3	7.4	0.8	8.2	14.0	22.4	36.5
1975	3.2	8.5	11.7	5.4	8.1	13.5	8.6	16.6	25.2
1976	2.8	10.3	13.1	12.1	3.7	15.8	14.9	14.0	28.9
1977 C/	2.7	5.7	8.4	3.5	0.1	3.6	6.2	5.8	12.0
1978 D/	1.9	4.8	6.7	0.1	0.2	0.3	2.2	5.3	7.5
1979 E/	1.6	5.3	6.9	T	T	T	1.7	5.5	7.2

A/ CATCHES OF MOTHERSHIP-LONGLINE NORTH PACIFIC TRAWL FISHERY AND LANDBASED DRAGNET FISHERY

B/ INCLUDING ROCKFISH OTHER THAN PACIFIC OCEAN PERCH(1976-77)

C/ INCLUDES R.O.K. CATCH OF 442MT FROM BERING SEA AND 83MT FROM ALEUTIANS.

D/ PRELIMINARY; INCLUDES R.O.K. CATCH OF 212MT FROM BERING SEA AND 271MT FROM ALEUTIAN ISLANDS AND 7MT CATCH BY TAIWAN IN THE BERING SEA

E/ INCLUDES ROK CATCH OF 123MT FROM BERING SEA AND 159MT FROM ALEUTIANS, TAIWAN CATCH OF 3MT FROM BERING SEA AND POLISH CATCH OF 2MT FROM BERING SEA, USSR CATCH OF 3MT FROM BERING SEA AND 18MT FROM ALEUTIONS.

I.6.2 Equilibrium Yield

Pacific Ocean Perch

Since 1960, the Eastern Slope region has produced Pacific ocean perch catches in excess of 30,000 mt only twice (1961 and 1968). Following each such instance, catches fell substantially (Table I-10) and after the large 1968 catch, dropped to very low levels. An inspection of catch (Table I-10) and catch rates (Table I-11) indicate that perch stocks of the Eastern Slope Region could not support removals of even 10,000-15,000 mt annually without a further reduction of the already low stock abundance.

In the Aleutian Region, there have been more obvious signs of over-exploitation, particularly in early stages of the fishery when catches in excess of 90,000 mt were taken annually in 1964-66. Since 1970, catches have averaged 16,400 mt annually.

It was the concensus of Canadian, Japanese, and U.S. scientists at the 1975 annual meeting of INPFC that Pacific ocean perch stocks were at a low level of abundance, and generally in poor biological condition. This opinion was derived from various status of stock indicators including (i) a continuous decline in CPUE since 1968; (ii) drastic reductions in the availability of all sizes of ocean perch through the period 1969-72; (iii) a heavy dependence in the fishery after 1968 on young-small fish; and (iv) the lack of any evidence of strong incoming year-classes.

Eastern Bering Sea Slope Area

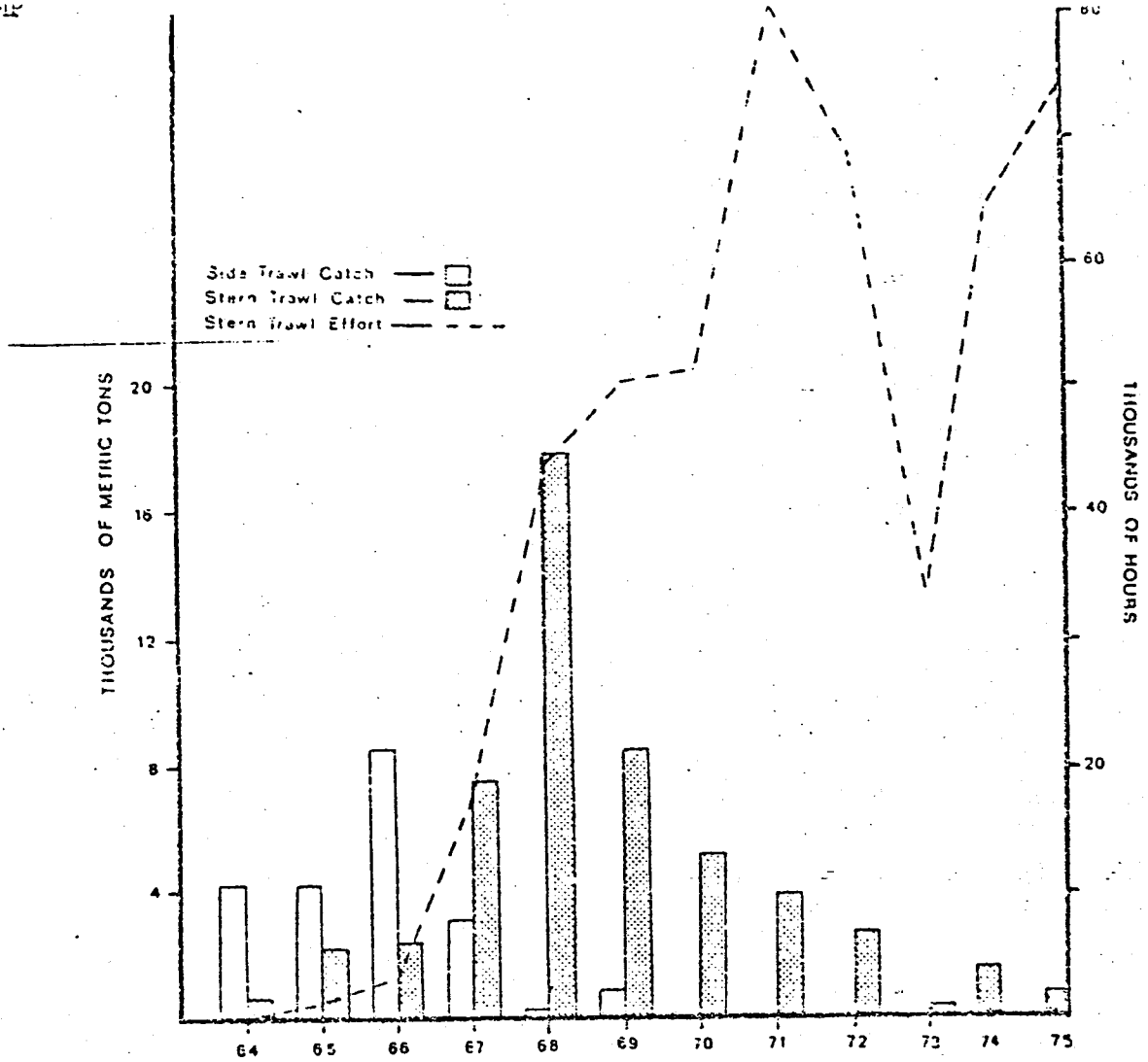
In the Eastern Slope Region, CPUE data indicate that stock abundance has declined severely from the 1960's and has fluctuated at a low level in the 1970's (Table I-11). Moreover, catch rates have declined to very low levels at depths greater than 125 m where most of the Pacific ocean perch grounds are found (Figure I-6).

TABLE I-11 -- PACIFIC OCEAN PERCH CATCH AND EFFORT DATA OF STERN TRAWLERS IN THE JAPANESE MOTHERSHIP-LONGLINE-NORTH PACIFIC TRAWL FISHERY BY VESSEL CLASS IN THE EASTERN BERING SEA SLOPE REGION, 1968-78.

	VESSEL CLASS A/						
YEAR	3	4	5	6	7	8	9
(A) CATCH IN METRIC TONS.							
1968	895	3,847	695	1,938	378	10,012	1,776
1969	361	3,709	102	258	94	4,037	2,103
1970	77	215	78	55	301	3,168	1,495
1971	96	1,558	35	203	992	1,855	459
1972	--	1,005	317	7	410	313	1,276
1973	--	382	--	199	487	146	398
1974	--	640	90	520	700	609	735
1975	--	578	204	343	784	171	293
1976	--	323	188	152	772	70	545
1977	--	380	357	155	114	193	534
1978	--	531	154	178	54	130	545
(B) FISHING EFFORT IN HUNDRED HOURS TRAWLED.							
1968	104	298	26	18	1	67	46
1969	95	264	17	15	12	95	125
1970	103	293	18	2	34	122	139
1971	125	411	21	19	35	146	266
1972	120	348	29	13	49	140	198
1973	--	267	13	16	35	118	397
1974	--	290	27	39	37	171	391
1975	--	419	55	41	38	158	363
1976	--	502	41	5	19	147	360
1977	--	444	30	15	5	99	318
1978	--	594	56	38	5	99	353
(C) PERCENTAGE COMPOSITION IN TOTAL OCEAN PERCH CATCH BY VESSEL CLASS CATEGORY.							
1968	4	19	3	10	2	49	9
1969	3	31	1	2	1	34	18
1970	1	4	1	1	6	58	27
1971	2	30	1	4	19	35	9
1972	--	29	9	+	12	9	37
1973	--	22	--	12	28	9	23
1974	--	19	3	15	21	18	22
1975	--	23	8	14	32	7	12
1976	--	15	9	7	37	3	26
1977	--	21	19	8	6	11	29
1978	--	32	9	11	3	8	33
(D) CPUE IN MT PER HOUR TRAWLED.							
1968	.08	.13	.26	1.10	2.55	1.50	.39
1969	.03	.14	.06	.18	.08	.42	.17
1970	.01	.01	.04	.23	.09	.26	.11
1971	.01	.04	.02	.11	.28	.13	.02
1972	--	.03	.10	.01	.07	.02	.05
1973	--	.01	--	.12	.14	.01	.01
1974	--	.02	.03	.13	.19	.04	.02
1975	--	.01	.04	.08	.21	.01	.01
1976	--	.01	.05	.33	.41	.01	.02
1977	--	.01	.12	.10	.25	.02	.02
1978	--	.01	.03	.05	.12	.01	.02

A/ NO DATA FOR CLASSES 1 AND 2. 1973-1978 DATA CONVERTED TO PRE-1973 GROSS TONNAGE CLASSIFICATION OF

1 = 71-100 4 = 301-500 7 = 1501-2500
2 = 101-200 5 = 501-1000 8 = 2501-3500
3 = 201-300 6 = 1001-1500 9 = 3501 AND ABOVE



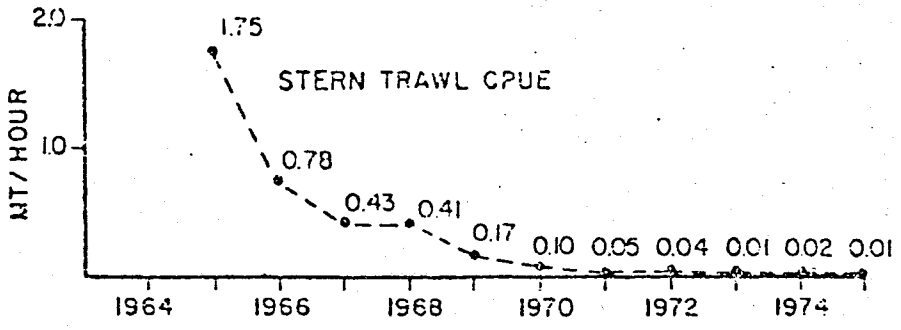


Figure I-6.--Annual catches of Pacific ocean perch by side and stern trawlers, and stern trawl effort by the Japanese mothership, longline, and North Pacific trawl fisheries, in areas of the Eastern Slope Region where depths exceed 125 meters.

A continuation of the decline in abundance between 1977 and 1978 is also indicated by CPUE data collected by U.S. observers aboard Japanese and Republic of Korea (R.O.K) trawlers as shown below:

Area	Type of Trawler	CPUE (Kg/hr)	
		1977	1978
East of 170°W	Japanese small trawler	13	2
	Japanese large trawler	42	11
	R.O.K. large trawler	12	7
170°W-180°	Japanese small trawler	3	8
	Japanese large trawler	25	11

The spawning stock of Pacific ocean perch in the Eastern Slope Region must also be reduced from levels of the 1960's. The large catches of ocean perch by Japan and the U.S.S.R. in the early 1960's appear to have removed the larger and older fish from the stock, which undoubtedly had an influence on the reproductive potential. Chikuni (1975) reported that the fecundity of ocean perch in this region was as follows: 10,000 eggs at age 7, 29,000 at age 10, 75,000 at age 15, 122,000 at age 20, and 162,000 at age 25.

It is clear that Pacific ocean perch stocks from the eastern Bering Sea are at an extremely low level of abundance. On the basis of fishery information through 1974, it was estimated in the 1977 Preliminary Management Plan for the Trawl Fishery of the Bering Sea that equilibrium yield for Pacific ocean perch was only 6,500 mt. However, the all-nation catch for 1978 was only 2,200 mt, and in view of continued declines in CPUE through 1978, it is doubtful that current EY is any higher than 5,000 mt.

Aleutian Area

CPUE data from both the Japanese independent stern trawl fishery (Table I-12) and the landbased dragnet fishery (Table I-12) indicate that abundance has been fluctuating at a very low level since 1971 relative to earlier years. The CPUE of vessel classes 4 and 7 (301-500 gross tons and 1,500-2,500 gross tons, respectively) which have accounted for most of the annual catches of ocean perch by stern trawlers, declined sharply from 1968 to 1977 (Table I-12). On the basis of catch trends, it is believed that stock abundance in 1968 was already reduced considerably below that of earlier years.

Catch rates (kg per hour) continued to decline from 1977 to 1978 based on U.S. observer data collected aboard Japanese and Soviet trawlers in the as shown below:

	1977	1978
Japanese small trawlers	648	58
U.S.S.R. large trawlers	196	61

Length-frequency information also illustrates the poor condition of ocean perch stocks in the Aleutian area (Figure I-7). In the early years of the fishery (1964-67), the size composition in the Japanese catches was relatively stable and dominated by fish greater than 28 cm. After 1967, there was a large increase in the proportion of fish smaller than 28 cm, due in part to recruitment into the fishery of the strong year-classes of 1961 and 1962, and in part to a considerable reduction in abundance of larger perch. The abundance of older fish remained low through 1975. The reduced abundance of older fish in the 1970's as compared to the 1960's (Figure I-7) must lead to a reduced reproductive potential of the Aleutian area

TABLE I-12.--PACIFIC OCEAN PERCH CATCH AND EFFORT DATA FOR STERN TRAWLERS OF THE JAPANESE MOTHERSHIP-LONGLINE NORTH PACIFIC TRAWL FISHERY BY VESSEL IN THE ALEUTIAN REGION, 1968-78.

YEAR	VESSEL CLASS A/ 4	5	6	7	8	9
(A) CATCH IN METRIC TONS.						
1968	12,157	280	32	2,711	6,787	532
1969	7,290	440	0	4,839	1,125	144
1970	2,384	1,227	0	7,741	249	82
1971	3,322	889	1,038	4,984	2,249	449
1972	3,527	1,318	645	2,035	188	135
1973	4,596	0	995	1,881	0	0
1974	10,679	1,564	1,326	2,507	25	16
1975	3,916	972	764	1,815	666	0
1976	4,862	838	786	1,600	83	0
1977	2,802	771	219	580	37	0
1978	2,342	480	140	855	183	0
(B) FISHING EFFORT IN NUMBER OF HOURS TRAWLED.						
1968	8,575	155	8	216	759	772
1969	1,952	333	0	910	178	38
1970	1,755	600	0	976	161	25
1971	4,543	634	383	720	785	174
1972	6,533	546	492	388	114	56
1973	3,989	0	658	530	36	0
1974	13,908	1,816	964	529	70	22
1975	12,333	1,233	543	521	509	0
1976	10,179	897	698	561	251	0
1977	7,594	1,095	248	400	89	0
1978	8,820	957	206	595	315	0
(C) PERCENTAGE COMPOSITION OF TOTAL OCEAN PERCH CATCH BY VESSEL CLASS. B/						
1968	54	1	+	12	30	2
1969	51	3	0	34	8	1
1970	20	10	0	66	2	1
1971	26	7	8	38	17	3
1972	45	17	8	26	2	2
1973	62	0	13	25	0	0
1974	66	10	8	16	0	+
1975	48	12	9	22	8	0
1976	60	10	10	20	1	0
1977	63	17	5	13	1	0
1978	58	12	3	21	5	0
(D) CATCH IN MT PER HOUR TRAWLED.						
1968	1.4	2.4	4.0	12.6	8.9	0.7
1969	3.7	1.3	--	5.3	6.3	3.8
1970	1.4	2.0	--	7.9	1.5	3.3
1971	0.7	1.4	2.7	6.9	2.9	2.6
1972	0.5	2.4	1.3	5.2	1.6	2.4
1973	1.2	--	1.5	3.5	--	--
1974	0.8	0.9	1.4	4.7	0.4	0.7
1975	0.3	0.8	1.4	3.5	1.3	--
1976	0.5	0.9	1.1	2.9	0.3	--
1977	0.4	0.7	0.9	1.5	0.4	--
1978	0.3	0.5	0.7	1.4	0.6	--

A/ NO DATA FOR CLASSES 1, 2, AND 3 WHICH ARE MAINLY SIDE AND PAIR TRAWLS. 1973-1978 DATA CONVERTED TO PRE-1973 GROSS TONNAGE CLASSIFICATION OF

1 = 71-100 4 = 301-500 7 = 1501-2500
2 = 101-200 5 = 501-1000 8 = 2501-3500
3 = 201-300 6 = 1001-1500 9 = 3501 AND ABOVE

B/ TOTALS MAY FALL SHORT OF 100% BECAUSE OF ROUNDING METHOD.

TABLE I-13. -- PACIFIC OCEAN PERCH CATCH AND EFFORT DATA OF STERN TRAWLERS OF THE JAPANESE LANDBASED DRAGNET FISHERY IN THE ALEUTIAN REGION, 1969-78.

YEAR	CATCH OF ALL SPECIES IN MT	CATCH OF PACIFIC OCEAN PERCH IN MT	PERCENTAGE OF POP IN TOTAL CATCH	TOTAL EFFORT IN HOURS	CPUE OF POP IN MT PER HOUR
1969	5,292	1,194	23	3,578	.33
1970	4,439	1,949	44	4,855	.40
1971	5,952	1,664	28	6,520	.26
1972	17,636	647	4	16,941	.04
1973	16,090	1,871	12	12,657	.15
1974	24,843	5,571	22	22,568	.25
1975	8,105	1,268	16	8,627	.15
1976	8,546	2,640	31	9,622	.27
1977	27,418	1,326	5	41,048	.03
1978	25,128	769	3	41,902	.02

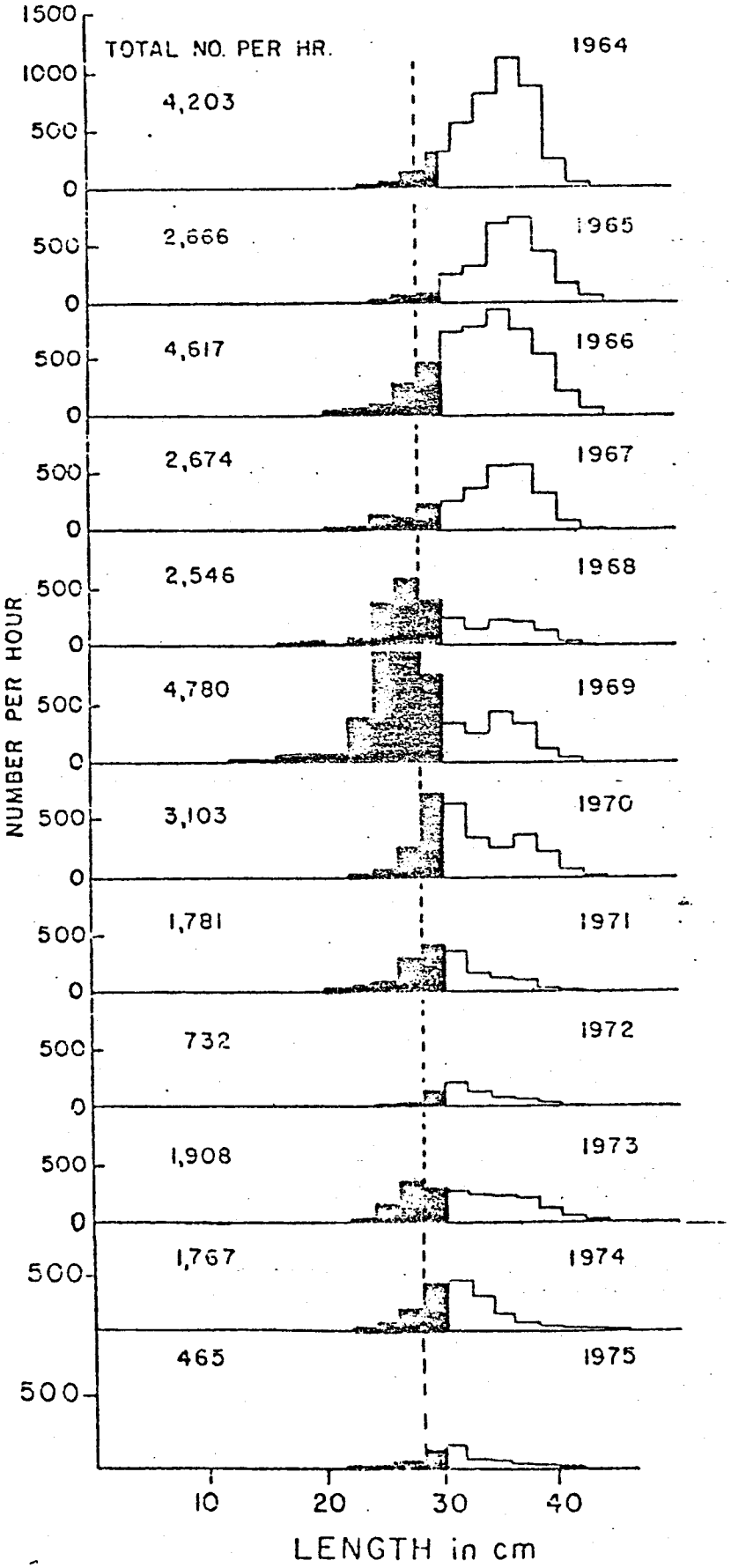


Figure I-7 .--Catch per unit effort by size increment for Pacific ocean perch harvested by stern trawlers of the Japanese mothership-longline North Pacific trawl fishery in the Aleutian Region, 1964-75.

perch stock. Recruitment of ocean perch to the fishery occurs at about 6-8 years of age; thus, year-classes spawned during the peak years of fishing (1964-66) would have appeared in catches beginning about 1970. As shown by CPUE values for small fish (less than 28 cm) in 1970-75, recruitment was relatively low with the 1975 catch rates the lowest on record (Figure I-7).

In summary, it is evident that Pacific ocean perch stocks in the Aleutian area are at an extremely low level of abundance with no evidence of strong recruitment in recent years. On the basis of fishery information through 1974, it was estimated in the 1977 PMP that EY is the Aleutians was 15,000 mt. Based on fishery information available since then, this EY appears too high. Both catch and CPUE have continued to decline through 1978 with no indication of strong year-classes coming into the fishery. It appears, therefore, that EY is currently no higher than 13,000 mt.

Other Rockfish

For this species category, there is little catch or biological information bearing on the condition of the stocks. Estimates of the foreign catch of "other rockfish" by U.S. observers (Nelson et al., 1978; 1979) for 1977 and 1978 are as follows:

Region	Catch (mt) 1977	1978
Eastern Bering Sea	47	12,155
Aleutians	7,680	8,737
Total	7,727	20,892

The much larger catch in 1978 over 1977 in the eastern Bering Sea undoubtedly represents an artifact of the sampling effort by observers rather than an increase of this magnitude in the actual catch. The 1978 estimate is based on

coverage of vessels taking rockfish and is therefore assumed to be more representative of the actual catches taken in this region. The 1978 observer estimate of 12,000 mt also falls within the range of MSY (7,000-15,000 mt) estimated by Ikeda (1979) for the eatern Bering Sea slope region. It should be pointed out, however, that the all-nation catch of other rockfish as reported by foreign fisheries for the eastern Bering Sea was only about 4,900 mt in 1977 and 2,400 mt in 1978. Because of the limited and conflicting information available, it is difficult to estimate EY for other rockfish in the eastern Bering Sea. As a first approximation, the EY will be estimated as the lower end of the MSY range given by Ikeda (1979) or 7,000 mt.

For the Aleutian Island region, there is better agreement in catch data from the various sources. Respective observer and foreign reported catches of other rockfish were 7,700 and 7,000 mt in 1977 and 8,700 and 5,700 mt in 1978. All of these catch figures are well below estimates of MSY (23,000-45,000 mt) given by Ikeda (1979). The best estimate of EY for the Aleutian region is considered to be a mean of the above four catch figures or 7,300 mt.

I.6.3 Acceptable Biological catch

Pacific ocean perch

The Pacific ocean perch stocks of the Bering Sea/Aleutian Region are badly depleted, and current EY is believed to be no more than 5,000 mt in the eastern Bering Sea and 13,000 mt in the Aleutians. Since the stocks do not appear to be rebuilding at all at present catch levels, the ABC of Pacific ocean perch will be set at 20% of the current EY in order to begin an anticipated long rebuilding process and to balance that against severe economic dislocation in the foreign trawl fisheries. Therefore, ABC is 1,000 mt in the eastern Bering Sea (Statistical Areas I and II, combined) and 2,600 mt in the Aleutians (Statistical Area IV).

Other rockfish

Information is lacking to assess the condition of this resource. ABC will be considered equivalant to the rough estimates of EY--7,000 mt in the eastern Bering Sea and 7,300 mt in the Aleutian Island region.

I.7. Sablefish (Blackcod)

I.7.1 Maximum Sustainable Yield

The sablefish resource is found in waters off California, northward to the Gulf of Alaska, westward to the Aleutian Region, and into the Bering Sea. The sablefish found in these wide geographical regions are apparently genetically related in the sense that some migrations have been noted to occur between the regions. However, the degree of interchange between regions is noted to be small in relation to the stock size within each region which led Low et al. (1976) and Wespestad et al. (1977) to suggest that management of the resoruce be conducted by discrete geographical regions. These geographical regions are the eastern Bering Sea, the Aleutian Region, the Gulf of Alaska, waters off Canada, and waters off Washington to California.

Although the sablefish resource should be managed by regions, the long-term productivity in each region is probably related to the overall condition of the resource. Therefore, it is difficult to accurately estimate MSY within each region by using fishery information of that region alone. To reduce this problem, both Japanese and U.S. scientists have estimated MSY of the resource as a whole. The latest Japanese estimate of MSY for the entire resource from California to the Bering Sea was 69,600 mt (Anon. 1978). The current U.S. estimate of MSY, using essentaily the same general production model as the Japanese, but with a different weighting of data among regions is 50,300 mt (Low and Wespestad, 1979). The MSY estimate of 69,600 mt appears high in view of the fact that the highest catch of record is 65,500 mt (1972) and that average catches from 1968 to 1975 of 48,200 mt (Table I-13) have resulted in

TABLE I-13. -- HISTORICAL CATCHES OF SABLEFISH IN METRIC TONS BY AREA AND NATION, 1958-78.

	BERING SEA			ALEUTIAN REGION			
YEAR	JAPAN A/	USSR	TOTAL	JAPAN A/	ROK	USSR	TOTAL
1958	32	--	32	B/	--	--	B/
1959	393	--	393	B/	--	--	B/
1960	1,861	--	1,861	B/	--	--	B/
1961	26,182	--	26,182	B/	--	--	B/
1962	28,521	--	28,521	B/	--	--	B/
1963	18,404	--	18,404	B/	--	--	B/
1964	8,262	--	8,252	975	--	--	975
1965	8,240	--	8,240	360	--	--	360
1966	11,981	--	11,981	1,107	--	--	1,107
1967	13,457	274	13,731	1,383	--	--	1,383
1968	14,597	4,256	18,853	1,661	--	--	1,661
1969	17,009	1,579	18,588	1,804	--	--	1,804
1970	9,627	2,874	12,501	1,277	--	--	1,277
1971	12,410	2,830	15,240	2,571	--	170	2,741
1972	13,231	2,137	15,368	3,307	--	269	3,576
1973	6,395	1,220	7,615	2,875	--	134	3,009
1974	5,081	77	5,158	2,506	--	14	2,520
1975	3,384	38	3,422	1,538	--	79	1,617
1976	3,267	29	3,296	1,573	--	61	1,634
1977	2,109	0	2,109	1,631	86	0	1,717
1978	1,007	0	1,139 C/	798	23	0	821
1979	1,071	49	1,389 D/	617	164	0	716

A/ JAPANESE CATCH IS REPORTED BY FISHING YEAR (NOVEMBER-OCTOBER); ALL OTHER CATCHES ARE REPORTED BY CALENDAR YEAR.

B/ INCLUDED IN THE BERING SEA CATCH TOTALS.

C/ INCLUDES 127MT BY ROK AND 5MT BY TAIWAN

C/ INCLUDES 6MT BY TAIWAN, 261MT BY ROK, AND 2MT BY POLAND

SOURCE: SASAKI, 1976 AND PERS. COMM., T. SASAKI, FAR SEAS FISHERY RESEARCH LAB., SHIMIZU, JAPAN. USSR DATA FROM U.S.-USSR FISHERY STATISTIC EXCHANGE.

continuing and rapid declines in CPUE (Table I-14); accordingly, the U.S. estimate of overall MSY is considered to be most appropriate--50,300 mt.

The U.S. estimate of MSY was apportioned to major regions according to historic catches: Bering Sea (25%), Aleutian region (4%), Gulf of Alaska (47%), and British Columbia-Washington region (25%). These apportioned MSY estimates were also compared to MSY estimates derived by applying general production models region by region. The comparisons show that MSY was 13,000 mt for the eastern Bering Sea and 2,100 mt for the Aleutian region (Low and Wespestad 1979).

TABLE I-14.-- SABLEFISH CATCH PER UNIT EFFORT TRENDS IN THE EASTERN BERING SEA AND ALEUTIAN REGION.

	EASTERN BERING SEA				ALEUTIAN REGION				
	CPUE 1	CPUE 2	CPUE 3	CPUE 5	CPUE 1	CPUE 2	CPUE 3	CPUE 4	CPUE 5
1964	61	93	2.4		139	141	3.1		
1965	54	105	3.0		110	183	4.1		
1966	139	166	4.5		229	233	6.3		
1967	210	216	6.2	151	277	275	7.1		154
1968	143	140	5.1	134	165	161	5.9		259
1969	189	187	6.9	142	184	183	7.1		318
1970	231	241	8.7	50	189	241	9.4		112
1971	120	185	5.6	76	165	202	9.4	4.5	222
1972	50	117	3.3	62	203	208	11.6	11.8	123
1973	47	148	6.0	41	192	204	7.7	4.6	115
1974	141	164	7.4	24	187	208	7.8	4.4	44
1975	68	131	4.9	13	98	168	6.0	1.8	30
1976	69	147	5.6	6	71	114	4.5		7
1977	73		5.4	4	70	108	4.0	1.1	4
1978	16			1	24				17

CPUE 1: U.S. ESTIMATE, KG PER 10 HACHI LONGLINE UNITS
CPUE 2: JAPANESE ESTIMATE, KG PER 10 HACHI LONGLINE UNITS
CPUE 3: JAPANESE ESTIMATE, MT PER VESSEL-DAY FISHING BY LONGLINERS
CPUE 4: U.S. ESTIMATE, MT PER VESSEL-DAY FISHING BY LONGLINERS
CPUE 5: U.S. ESTIMATE, KG PER HOUR TRAWLING BY LAND-BASED STERN TRAWLERS

DATA SOURCES: CPUE 1, CPUE 4, AND CPUE 5 FROM LOW(1977)

CPUE 2 AND CPUE 3 FROM ANONYMOUS(1978b)

I.7.2 Equilibrium Yield

Catch and CPUE trends clearly indicate that sablefish stocks in the eastern Bering Sea/Aleutian Region are considerably reduced in abundance when compared to earlier years of the fishery. CPUE data analyzed by different procedures by U.S. and Japanese scientists both show declining trends in catch rates (Table I-14) but the trends in the U.S. analysis are much more severe.

The main difference in CPUE computations was the interpretation and selection of appropriate fishing effort. U.S. scientists attributed all longline fishing effort to sablefish since that is the target species of the fishery. Japanese scientists selected only that portion of the time spent fishing by excluding time spent for traveling, loading, weathering storms, repairs, and other activites not considered to be associated with productive fishing.

Eastern Bering Sea

Although differences in U.S. and Japanese CPUE values have not been rectified, it is important to note that both catch (Table I-13) and longline CPUE (standardized to 100 units for 1970 from Table I-14) have declined substantially in the eastern Bering Sea since 1970:

	1970	1971	1972	1973	1974	1975	1976	1977	1978
Catch	12,500	12,200	15,400	7,600	5,200	3,400	3,300	2,100	1,100
CPUE	100	64	36	50	71	46	52	48	---

A CPUE value is not calculated for 1978 because of major changes in the fishing pattern brought about by fishing regulations. Analysis of catch

and CPUE trends for 1977, Low et al. (1978) determined that EY for sablefish in the Bering Sea was 3,500 mt--the average catch for 1974-77.

U.S. observer data show higher abundance of small sablefish (38-50 cm) in Area I (east of 170°W) of the Bering Sea in 1978 than in 1977 (Bakkala et al., 1979). This increase in abundance of juvenile fish has also been noted in U.S. and Japanese research vessel surveys (data on file, Northwest and Alaska Fisheries Center, Seattle; Sasaki, 1979). These observations suggest an improvement in the sablefish resource in the future.

Currently, however, long-term trends in catch and CPUE indicate that abundance of the adult stock remains low. Sablefish are not known to spawn in the Bering Sea, and most of the fish in the eastern Bering Sea are probably recruited from the Gulf of Alaska. Because EY in the Gulf of Alaska has declined 25% from 1976 to 1978, it is likely that EY in the Bering Sea has also declined correspondingly over the same period to 2,600 mt.

Aleutian Region

As in the eastern Bering Sea, both catch (Table I-13) and longline CPUE (Standardized to 100 units for 1972 from Table I-14) have declined:

	1972	1973	1974	1975	1976	1977	1978
Catch	3,600	3,200	2,500	1,600	1,600	1,700	800
CPUE	100	86	86	60	43	40	---

Comparable CPUE information for 1978 cannot be compiled, for the same reasons given for the eastern Bering Sea. However, data collected from Japanese longliners by U.S. observers show that CPUE declined by more than 50% from 1977 to 1978:

	1977 (September)	1978 (June-September)
Sablefish CPUE (kg/1,000 hooks/day)	6.814	3.116
Average depth per set (m)	593	509
Most abundatn species caught	Greenland turbot	Pacific cod
Second most abundant species	Sablefish	Sablefish

This decline in CPUE may not accurate reflect changes in overall sablefish abundance because the time period and average depths of fishing differed in the two years.

Although changes in fishing patterns brought about by U.S. fishing regulations may account for some of the recent decline in CPUE, the long-term nature of the decline indicates that abundance is reduced throughout the North Pacific. As in the case of the eastern Bering Sea, it is likely that EY in the Aleutian Area has declined 25% from 1,500 mt to 1,100 mt.

I.7.3 Acceptable Biological catch

Sablefish stocks in this Region have been overfished and are not now capable of producing MSY. The source of recruitment to these stocks is not known; neither eggs nor larvae of sablefish have been detected in the Region. It is probable, therefore, that recruitment comes from reproduction in the Gulf of Alaska. Accordingly, because EY in the Gulf of Alaska declined 25% from 1976-78, a corresponding decline is assumed to have occurred in the eastern Bering Sea and Aleutians. ABC is, therefore, considered equivalent to EY-2,600 mt in the eastern Bering Sea and 1,100 mt in the Aleutian Area.

I.8 Atka Mackerel

1.8.1 Maximum Sustainable Yield

The fishery for Atka mackerel is relatively new and has been conducted primarily by the U.S.S.R. The main fishing area is the western Aleutian Islands, with small amounts taken in the eastern Bering Sea. Reported catches have been as follows:

Year		1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Catch(mt):	U.S.S.R.	949	---	5,907	1,712	1,377	13,326	13,126	20,975	22,600	20,277
	Japan									1,531	1,656
	R.O.K.									97	1,329
	Poland										2
	Total									24,228	23,264

MSY in the Bering Sea/Aleutian Region has been tentatively estimated at 33,000 mt by Soviet scientists. These estimtes were based on Soviet hydroacoustic-trawl surveys in the Aleutian area in 1974 and 1975 which produced biomass estimates of 35,000-110,000 mt, of which 30% or 10,500-33,000 was assumed to be exploitable. Because neither the Soviet data nor the analytical procedures used to estimate biomass and sustainable yield have been available to scientists of other countries, these estimates must be considered provisional.

I.8.2 Equilibrium Yield

Biological and catch and effort data collected by U.S. observers aboard Soviet vessels have revealed that mean length, weight, age and CPUE were similar in 1977 and 1978, but improved in 1979 (Table I-15). This improvement was partially due to the development of new fishing grounds in the vicinity of Seguam Island, in the eastern Aleutians. Fishing has previously been conducted principally in the western Aleutians. Because of the provisional nature of the MSY estimate and the limited fishery and biological data available for Atka mackerel, it is neither possible to estimate EY nor to determine whether current EY is equal to or less than MSY.

Table I-15.--Mean age, length, weight, and CPUE of Atka mackerel fisheries.

Parameter	YEAR				
	1977	1978	1979		
			(all areas)	(W. of 180^0)	(E. of 180^o)
Mean age	2.50	2.50	2.90a/	3.40	2.50
Mean length (cm)	29.30	29.40	32.90	31.20	33.30
Mean weight (kg)	0.27	0.27	0.46	0.35	0.49
CPUE (mt/hr)	5.30	4.50	7.80	--	--
Sample size	14,529	12,474	7,290	1,515	5,775

I.8.3 Acceptable Biological Catch

In the PMP for 1977 and 1978, the allowable catch of this species was set at 24,800 mt, 75 per cent of the unverified Soviet estimate of MSY of 33,000 mt. The information currently available provides no biological basis for changing this allowable catch; accordingly ABC is equivalent to the 1977-78 allowable catch of 24,800 mt.

I.9 Squid

I.9.1 Maximum Sustainable Yield

Virtually nothing is known about the distribution and abundance of squid in the eastern Bering Sea and Aleutians. Some elements of the Japanese fishery have targeted on squid with the principal species in catches Gonatus magister and Onychoteuthis borealijaponicus. G. magister is the principal species taken in the eastern Bering Sea and O. borealijaponicus the principal species in the Aleutians. Combined all-nation catches from the eastern Bering Sea and Aleutians in 1977 and 1978 were as follows:

Nation	1977	1978	1979
Japan	8,316	9,138	5,739
R.O.K.		215	1,233
Taiwan		35	14
U.S.S.R.		23	6
Poland			25
Total	8,316	9,411	7,017

I.9.2 Equilibrium Yield

Catches of 10,000 mt are believed to be sustainable.

I.9.3 Aceptable Biological Catch (ABC)

ABC is equivalent to the minimal estimate of MSY--10,000 mt.

I.10 Pacific Halibut

I.10.1 Maximum Sustainable Yield

Dunlop et al. (1964) estimated that MSY was about 3,000 mt (round weight) in the southeastern Bering Sea (IPHC Areas 4A and 4B).

Historically, this area has been the most productive for the North American setline fishery, and the MSY for the entire eastern Bering Sea (east of 175°W) probably is no more than 5,000 mt. Estimates of MSY are not available for the western Bering Sea as the North American setline catch in this area has been minor (less than 300 mt). Relatively large catches of halibut (over 3,000 mt) in the western Bering Sea were reported by the Japanese setline fishery in the early 1960's. MSY has not been estimated for the Aleutian area; stocks are small relative to those in the Bering Sea and are considered to be a component of stocks in the Gulf of Alaska.

I.10.1 Equilibrium Yield

Halibut stocks have declined sharply in the eastern Bering Sea since the early 1960's. This is indicated by a decline in CPUE in the North American setline fishery (IPHC 1977) and by IPHC surveys of juvenile halibut (Best 1977). Since 1970, stocks of adult halibut appear to have stabalized at a low level and the North American setline catch has averaged about 300mt. The incidental catch of juvenile halibut in the eastern Bering Sea peaked in 1971 at about 7,000 mt but has declined since then. Recent surveys indicate an increase in the abundance of juveniles, but abundance is still below that in the early 1960's, and the increase will not benefit the setline fishery for several years. Therefore, the equilibrium yield available to the North American

setline fishery probably is about the same as the present level of catch, and is well below MSY.

The EY in the western Bering Sea and Aleutians is unknown but probably substantially below MSY.

I.10.3 Acceptable biological Catch

ABC and OY for Pacific halibut are not applicable to this Plan.

I.11.1 Other Included Species ("Others")

This category includes all species of finfishes taken by trawls and setlines except: pollock, rockfishes, soles and flounders, sablefish, cod, Atka mackerel, herring, and salmon.

Virtually nothing is known of the population structure, biological attributes, or potential yield of the individual components of this category; therefore, only a pragmatic appraisal of "MSY" is possible.

During the last 5 years of record, the catch of this category has averaged about 4% with highs of 5-8% of the combined catch of the other, specified groundfish species. During that period, no indication of declining abundance has been noted; accordingly, it is assumed that the aggregation of stocks in the "others" category can sustain removals equal to at least 4% of the total catch of the specified species as long as that catch remains less than the 1972 peak of 2,234,500 mt.

Accordingly, "MSY" of this category is considered to be - 0.04 x 2,234,500 - 89,400 mt.

I.11.2 Equilibrium Yield

"MSY" is believed attainable.

I.11.3 Acceptable Biological Catch

ABC is considered equal to MSY = 89,400 mt.

ANNEX I: LITERATURE CITED

Alverson, D.L. and W.T. Pereyra. 1969. Demersal fish explorations in the northeastern Pacific Ocean--an evaluation of exploratory fishing methods and analytical approaches to stock size and yield forecasts. J. Fish. Res. Bd. Canada 26: 1985-2001.

Anonymous. 1978a. Report of the working group on average density index computation for pollock in the eastern Bering Sea to the INPFC Biology and Research Committee. U.S. Dept. of Commerce, NOAA, NMFS, NWAFC, Seattle, WA (unpubl.).

Anonymous, 1978b. Report of the meeting between U.S. and Japanese scientists for the exchange of information on the condition fo fishery stocks in the Bering Sea and northeastern Pacific. U.S. Dept. of Commerce, NOAA, NMFS, NWAFC, Seattle, WA (unpubl.).

Bakkala, R., L. Low, and V. Wespestad. 1979. Condition of groundfish resources in the Bering Sea and Aleutian area. U.S. Dept. of Commerce, NOAA, NMFS, NWAFC, Seattle, WA. (Doc. submitted to INPFC), 106 p.

Best, E.A. 1977. Distribution and abundance of juvenile halibut in the northeastern Bering Sea. Int. Pacific Halibut Comm. Scient. Rept. No. 62. 23 p.

Chikuni, S. 1975. Biological study on the population of the Pacific ocean perch in the North Pacific. Bull. Far Seas Fish. Res. Lab. 12: 1-119.

Dunlop, Henry A., F. Howard Bell, Richard J. Myhre, William H. Hardman, and G. Morris Southward. 1964. Investigation, utilization and regulation of the halibut in the southeastern Bering Sea. Int. Pac. Halibut Comm. Rept. No. 35, 72 p.

Granfeldt, E. 1979. Estimation of vulnerability, availability, and catchability factors and exploitable biomasses in the Bering Sea and western Gulf of Alaska. U.S. Dept. of Commerce, NOAA, NMFS, NWAFC, Seattle, WA. Processed Rept. 79-12. 24 p.

Ikeda, I. 1979. Rockfish biomass in the eastern Bering slope and Aleutian area. Fish. Agency of Japan (Doc. submitted to INPFC), 12 p.

IPHC. 1977. The Pacific Halibut Fishery: catch, effort, and CPUE, 1929-75. Int. Pacific Halibut Comm. Tech. Rept. No. 14, 95 p.

Low, L.L. 1974. A study of four major groundfish fisheries of the Bering Sea. Ph.D. Dissertation. Univ. of Wash., Seattle, WA.

Low, L.L. 1977. Status of the sablefish resource in the Bering Sea and northeastern Pacific Ocean through 1977. U.S. Dept. of Commerce, NOAA, NMFS, NWAFC, Seattle, WA. (Doc. submitted to INPFC), 45 p.

Low, L., R. Bakkala, H. Larkins, S. Mizroch, V. Wespestad, and J. Akada. 1978. Information on groundfish resources in the Bering Sea and Aleutian region. U.S. Dept. of Commerce, NOAA, NMFS, NWAFC, Seattle, WA. (Doc. submitted to INPFC), 91 p.

Low, L.L., S.A. Mizroch, and M. Alton. 1977. Status of Alaska pollock stocks in the eastern Bering Sea. U.S. Dept. of Commerce, NOAA, NMFS, NWAFC, Seattle, WA. (Doc. submitted to INPFC), 33 p.

Low, L.L., G.K. Tanonaka, and H.H. Shippen. 1976. Sablefish of the northeastern Pacific Ocean and Bering Sea. U.S. Dept. of Commerce, NOAA, NMFS, NWAFC, Seattle, WA. (Processed Rept.), 115 p.

Low, L. and V. Wespestad. 1979. General production models on sablefish in the North Pacific. (Doc. submitted to INPFC), 13 p.

Nelson, R. Jr., R. French, J. Wall, and D. Hennick. 1978. Summary of U.S. observer sampling on foreign fishing vessels in Bering Sea/Aleutian Islands areas, 1977. U.S. dept. of Commerce, NOAA, NMFS, NWAFC, Seattle, WA. (Doc. submitted to INPFC), 73 p.

Nelson, R. Jr., R. French, and J. Wall. 1979. Summary of U.S. observer sampling on foreign fishing vessels in Bering Sea/Aleutian Islands region, 1978. U.S. Dept. of Commerce, NOAA, NMFS, NWAFC, Seattle, WA. (Doc. submitted to INPFC), 75 p.

Nunnallee, E.P. 1978. Report on observations aboard the Japanese research vessel Tomi Maru 52 during a Bering Sea (Aleutian Basin) pollock survey conducted in June-July, 1978. U.S. Dept. of Commerce, NOAA, NMFS, NWAFC, Seattle, WA. (Doc. submitted to INPFC), 10 p.

Okada, K. 1979a. Biological characteristics and distribution of pelagic pollock stocks on the Aleutian Basin. Fish. Agency of Japan. (Doc. submitted to INPFC), 12 p.

Okada, K. 1979b. Biomass estimates for the pelagic pollock on the Aleutian Basin on the echo sounder and midwater trawl in 1978. Fish. Agency of Japan. (Doc. submitted to INPFC), 8 p.

Pella, J.J. and P.K. Tomlinson. 1969. A generalized stock production model. Inter. Amer. Inp. Tuna Comm. Bull. 13(3): 5-22.

Rivard, D. and L.J. Bledsoe. 1978. Parameter estimation for the Pella-Tomlinson stock production model under nonequilibrium conditions. 76(3); 523-534.

Sasaki, T. 1976. Data on the Japanese blackcod fishery in the Bering Sea and the northeastern Pacific Ocean-IV (Development and history of the Japanese blackcod fishery through 1975, and status of the blackcod resource). Fish. Agency of Japan. (Doc. submitted to INPFC), 20 p.

Sasaki, T. 1979. Preliminary report on blackcod and Pacific cod survey by Ryusho Maru No. 15 in the Aleutian Region and the Gulf of Alaska in the summer of 1979. Fish. Agency of Japan. (Doc. submitted to INPFC) 46 p.

Wakabayashi, K. 1975. Studies on resources of the yellowfin sole in the eastern Bering Sea. II. Stock size estimated by the method of virtual population analysis and its annual changes. Fish. Agency of Japan. (Doc. submitted to INPFC), 22 p.

Wakabayashi, K. and R.G. Bakkala. 1978. Estimated catches of flounders by species in the Bering Sea - updated through 1976. U.S. Dept. of Commerce, NOAA, NMFS, NWAFC, Seattle, WA. (Doc. submitted to INPFC), 14 p.

Wespestad, V., K. Thorson, and S. Mizroch. Movement of sablefish in the northeastern Pacific Ocean and the Bering Sea. U.S. Dept. of Commerce, NOAA, NMFS, NWAFC, Seattle, WA (Unpubl.).

11. Substitute the following for Table II.3 in Annex II:

Table II.3 Initial DAH, Reserves and TALFF amounts (mt)

Species	Areas	Initial Reserve	Initial DAH	Initial TALFF
Pollock	I,II	95,200	19,550	837,250
	III,IV	3,220	--	28,980
Pacific Ocean Perch	I,II,III	350	1,380	1,770
	IV	350	1,380	1,770
Other Rockfish	I,II,III	700	775	5,525
	IV	700	775	5,525
Sablefish	I,II,III	210	930	960
	IV	70	470	160
Pacific Cod		7,000	43,265	19,735
Yellowfin Sole		8,400	26,200	49,400
Turbots		5,600	1,075	49,325
Other Flatfish		7,000	4,200	58,800
Atka Mackerel	IV	4,200	100	29,200
Squid		2,800	50	16,650
Other Species		4,200	2,000	35,800
TOTAL		140,000	102,150	1,140,850

12. Replace Annex III with the following:

ANNEX III - Derivation of Initial Total Allowable Level of Foreign Fishing (TALFF)

Species Group	Areas	Initial Allocation [1] (Metric Tons)	Initial DAH [2] (Metric Tons)	Initial TALFF [3] (Metric Tons)
Pollock	I,II	856,800	19,550	837,250
	III,IV	28,980	--	28,980
Pacific Ocean Perch	I,II,III	3,150	1,380	1,770
	IV	3,150	1,380	1,770
Other Rockfish	I,II,III	6,300	775	5,525
	IV	6,300	775	5,525
Sablefish	I,II,III	1,890	930	960
	IV	630	470	160
Pacific Cod	All	63,000	43,265	19,735
Yellowfin Sole	All	75,600	26,200	49,400
Turbots	All	50,400	1,075	49,325
Other Flatfish [4]	All	63,000	4,200	58,800
Atka Mackerel	IV	29,300	100	29,200
Squid	All	16,700	50	16,650
Other Species	All	37,800	2,000	35,800
TOTAL		1,243,000	102,150	1,140,850

[1] From Section 11.4 and Table 23.1
[2] From Annex II
[3] Initial Allocation - Initial DAH
[4] Excluding Pacific halibut

13. Replace Annex IVA, IVB, and IVC with revised Annex IVA, IVB, and IVC, attached.

Annex IV-A. All-nation catches in the Bering Sea/Aleutian Region, by major species groups, 1968-1980 (1,000's mt) 1/

Species	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979 2/	1980 2/
Pollock	702	863	1,257	1,744	1,875	1,759	1,588	1,357	1,238	888.2	978.3	941.6	1,019.1
Pacific cod	63.7	53.3	74.6	50.5	47.0	58.6	67.0	55.1	57.8	36.5	47.4	42.0	51.4
Pacific ocean perch	76.4	53.3	76.8	31.6	38.9	15.5	36.5	25.2	32.6	10.8	7.5	7.2	8.6
Sablefish	20.5	20.4	13.8	18.0	19.0	10.6	7.7	5.0	8.2	4.6	2.0	2.2	2.5
Halibut	7.1	6.3	7.7	8.6	5.9	4.3	2.2	1.6	1.2	0.6	0.7	1.3	0.4
Flounders	149.9	236.2	234.9	323.4	237.7	207.1	196.3	200.4	187.2	121.9	235.9	186.0	178.8
Atka mackerel	3/	3/	1.0	3/	4.7	1.7	1.4	13.3	20.7	21.0	24.2	23.3	20.5
Others	31.5	14.4	25.9	41.5	134.7	62.3	79.9	61.9	45.6	57.3	81.1	71.7	54.0
All species	1,051.1	1,247.1	1,691.7	2,216.6	2,362.9	2,119.1	1,979.0	1,719.5	1,591.3	1,140.9	1,377.0	1,274.0	1,335.3

1/ Values in this table may differ slightly from those used elsewhere in this document because of differences in apportioning between species not clearly listed in foreign statistical reports or differences in treating estimates based on U.S. surveillance when catches were not reported.

2/ Preliminary.

3/ Catch, if any, included under "Others".

AMENDED 81-1

Table 1--Foreign catches of groundfish in the eastern Bering Sea (east of 180°) 1954-79[1/2/]

Species	Nation	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
Pollock	Japan	-	-	-	-	6,924	32,793	26,097	24,216	58,765	103,353	171,957	229,275
	USSR	0	0	0	0	-	-	-	-	-	-	-	-
	ROK[3/]	0	0	0	0	0	0	0	0	0	0	0	0
	Others[4/]	0	0	0	0	0	0	0	0	0	0	0	0
	Total	-	-	-	-	6,924	32,793	26,097	24,216	58,765	103,353	171,957	229,275
Pacific cod	Japan	-	-	-	-	171	2,864	5,679	2,448	6,054	3,879	13,408	14,722
	USSR	0	0	0	0	-	-	-	-	-	-	-	-
	ROK	0	0	0	0	0	0	0	0	0	0	0	0
	Others	0	0	0	0	0	0	0	0	0	0	0	0
	Total	-	-	-	-	171	2,864	5,679	2,448	6,054	3,879	13,408	14,722
Pacific ocean perch and other rockfish	Japan	-	-	-	-	-	-	1,100	13,000	12,900	17,500	13,588	8,723
	USSR	0	0	0	0	-	-	5,000	34,000	7,000	7,000	7,000	9,000
	ROK	0	0	0	0	0	0	0	0	0	0	0	0
	Others	0	0	0	0	0	0	0	0	0	0	0	0
	Total	-	-	-	-	-	-	6,100	47,000	19,900	24,500	20,588	17,723
Sablefish	Japan	-	-	-	-	32	393	1,861	26,183	28,521	18,404	6,165	5,001
	USSR	0	0	0	0	-	-	-	-	-	-	-	-
	ROK	0	0	0	0	0	0	0	0	0	0	0	0
	Others	0	0	0	0	0	0	0	0	0	0	0	0
	Total	-	-	-	-	32	393	1,861	26,183	28,521	18,404	6,165	5,001
Yellowfin sole	Japan	12,562	14,690	24,697	24,145	39,153	123,121	360,103	399,542	281,103	20,504	48,880	26,039
	USSR	0	0	0	0	5,000	62,200	96,000	154,200	139,600	65,306	62,297	27,771
	ROK	0	0	0	0	0	0	0	0	0	0	0	0
	Others	0	0	0	0	0	0	0	0	0	0	0	0
	Total	12,562	14,690	24,697	24,145	44,153	185,321	456,103	553,742	420,703	85,810	111,177	53,810
Rock sole	Japan	-	-	-	-	-	-	-	-	-	1,196	1,432	1,780
	USSR	0	0	0	0	-	-	-	-	-	3,806	1,806	1,898
	ROK	0	0	0	0	0	0	0	0	0	0	0	0
	Others	0	0	0	0	0	0	0	0	0	0	0	0
	Total	-	-	-	-	-	-	-	-	-	5,002	3,238	3,678
Flathead sole	Japan	-	-	-	-	-	-	-	-	-	7,079	11,121	3,287
	USSR	0	0	0	0	-	-	-	-	-	22,546	14,167	3,426
	ROK	0	0	0	0	0	0	0	0	0	0	0	0
	Others	0	0	0	0	0	0	0	0	0	0	0	0
	Total	-	-	-	-	-	-	-	-	-	29,625	25,288	6,713
Alaska plaice	Japan	-	-	-	-	-	-	-	-	-	233	808	474
	USSR	0	0	0	0	-	-	-	-	-	742	1,030	505
	ROK	0	0	0	0	0	0	0	0	0	0	0	0
	Others	0	0	0	0	0	0	0	0	0	0	0	0
	Total	-	-	-	-	-	-	-	-	-	975	1,838	979
Pacific halibut	Japan	-	-	-	-	196	674	6,931	3,480	7,865	7,452	1,271	1,369
	USSR	0	0	0	0	-	-	-	-	-	-	-	-
	ROK	0	0	0	0	0	0	0	0	0	0	0	0
	Others	0	0	0	0	0	0	0	0	0	0	0	0
	Total	-	-	-	-	196	674	6,931	3,480	7,865	7,452	1,271	1,369
Arrowtooth flounder	Japan	Catches of arrowtooth flounder and Greenland turbot combined until 1970.											
	USSR												
	ROK												
	Others												
	Total												
Greenland turbot	Japan	-	-	-	-	-	-	36,843	57,348	58,226	31,565	33,729	7,947
	USSR	0	0	0	0	-	-	-	-	-	-	-	1,800
	ROK	0	0	0	0	0	0	0	0	0	0	0	0
	Others	0	0	0	0	0	0	0	0	0	0	0	0
	Total	-	-	-	-	-	-	36,843	57,348	58,226	31,565	33,729	9,747
Other groundfish	Japan	-	-	-	-	147	380	10,260	554	5,931	1,102	736	2,218
	USSR	0	0	0	0	-	-	-	-	-	-	-	-
	ROK	0	0	0	0	0	0	0	0	0	0	0	0
	Others	0	0	0	0	0	0	0	0	0	0	0	0
	Total	-	-	-	-	147	380	10,260	554	5,931	1,102	736	2,218
All groundfish total	Japan	12,562	14,690	24,697	24,145	46,623	160,225	448,874	526,771	459,365	212,267	303,095	300,835
	USSR	0	0	0	0	5,000	62,200	101,000	188,200	146,600	99,400	86,300	44,400
	ROK	0	0	0	0	0	0	0	0	0	0	0	0
	Others	0	0	0	0	0	0	0	0	0	0	0	0
All-nation total		12,562	14,690	24,697	24,145	51,623	222,425	549,874	714,971	605,965	311,667	389,395	345,235

1/ Catch statistics up to 1963 from Forrester et al. 1978, and for 1964-78 from data on file, Northwest and Alaska Fisheries Center, Seattle, with the following exceptions: Pacific ocean perch and other rockfish--Japanese catches 1960-63 and USSR catches 1960-66 from Chikuni 1975; and all flounders except halibut--all nation catches, 1954-76 from Wakabayashi and Bakkala 1978.

2/ 0 indicates no fishing; - indicates fishing but no catch reported.

3/ ROK - Republic of Korea.

4/ Other nations are Taiwan 1974-78 and Taiwan and Poland 1979.

Table 1.--Continued.

Species	Nation	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Pollock	Japan	261,694	550,152	701,124	830,525	1,231,347	1,514,030	1,616,532	1,471,189	1,250,654	1,065,078
	USSR	-	-	-	33,571	35,590	233,511	213,895	280,005	309,613	216,567
	ROK	0	0	1,200	5,000	5,000	10,000	9,200	3,100	26,000	3,438
	Others	0	0	0	0	0	0	0	0	-	-
	Total	261,694	550,152	702,324	869,096	1,271,937	1,757,541	1,839,627	1,754,294	1,586,267	1,285,083
Pacific cod	Japan	18,200	31,982	57,915	50,487	70,078	40,555	35,877	40,817	45,915	33,322
	USSR	-	-	-	-	-	2,486	7,028	12,569	16,547	18,229
	ROK	0	0	-	-	-	-	-	-	-	-
	Others	0	0	0	0	0	0	0	0	-	-
	Total	18,200	31,982	57,915	50,487	70,078	43,041	42,905	53,386	62,462	51,551
Pacific ocean perch and other rockfish	Japan	16,786	20,598	26,214	16,150	10,392	10,369	5,837	3,147	6,811	3,716
	USSR	9,000	-	3,087	-	-	-	150	475	31,877	16,465
	ROK	0	0	-	-	-	-	-	-	-	-
	Others	0	0	0	0	0	0	0	0	-	-
	Total	25,786	20,598	29,301	16,150	10,392	10,369	5,987	3,622	38,688	20,181
Sablefish	Japan	9,502	10,330	10,143	14,454	8,897	12,304	10,643	4,769	4,189	2,776
	USSR	-	1,237	4,256	1,579	2,874	2,830	2,137	1,192	77	38
	ROK	0	0	-	-	-	-	-	-	-	-
	Others	0	0	0	0	0	0	0	0	-	-
	Total	9,502	11,567	14,399	16,033	11,771	15,134	12,780	5,961	4,266	2,814
Yellowfin sole	Japan	45,423	60,429	40,834	81,449	59,851	82,179	34,846	75,724	37,947	59,715
	USSR	56,930	101,799	43,355	85,685	73,228	78,220	13,010	2,516	4,288	6,060
	ROK	0	0	-	-	-	-	-	-	-	-
	Others	0	0	0	0	0	0	0	0	-	-
	Total	102,353	162,228	84,189	167,134	133,079	160,399	47,856	78,240	42,235	65,775
Rock sole	Japan	4,037	1,890	2,633	4,285	9,616	20,159	43,055	22,840	17,311	9,682
	USSR	5,067	2,872	2,617	4,955	10,507	20,260	17,769	995	2,664	1,463
	ROK	0	0	-	-	-	-	-	-	-	-
	Others	0	0	0	0	0	0	0	0	-	-
	Total	9,104	4,762	5,250	9,240	20,123	40,419	60,824	23,835	19,975	11,145
Flathead sole	Japan	4,996	10,621	11,851	9,168	20,088	25,538	9,850	17,190	12,889	4,873
	USSR	6,024	12,816	9,724	9,395	21,064	25,486	5,840	951	2,028	672
	ROK	0	0	-	-	-	-	-	-	-	-
	Others	0	0	0	0	0	0	0	0	-	-
	Total	11,020	23,437	21,575	18,563	41,152	51,024	15,690	18,141	14,917	5,545
Alaska plaice	Japan	2,054	1,340	1,223	3,127	1,326	517	171	1,082	2,168	2,407
	USSR	2,579	2,513	1,396	3,815	2,076	475	119	35	220	207
	ROK	0	0	-	-	-	-	-	-	-	-
	Others	0	0	0	0	0	0	0	0	-	-
	Total	4,633	3,853	2,619	6,942	3,402	992	290	1,117	2,388	2,614
Pacific halibut	Japan	2,199	3,756	2,775	2,764	1,735	4,861	955	644	81	137
	USSR	-	-	-	-	-	-	490	296	123	137
	ROK	0	0	-	-	-	-	-	-	-	-
	Others	0	0	0	0	0	0	0	0	-	-
	Total	2,199	3,756	2,775	2,764	1,735	4,861	1,445	940	204	274
Arrowtooth flounder	Japan					9,354	11,603	3,823	4,929	2,823	1,241
	USSR					3,244	7,189	9,301	4,288	18,650	19,591
	ROK					-	-	-	-	-	-
	Others					0	0	0	0	-	-
	Total					12,598	18,792	13,124	9,217	21,473	20,832
Greenland turbot	Japan	10,842	21,230	19,980	19,231	14,715	30,193	49,813	43,354	58,834	52,625
	USSR	2,200	2,639	15,252	16,798	4,976	10,271	14,697	11,926	10,820	12,194
	ROK	0	0	-	-	-	-	-	-	-	-
	Others	0	0	0	0	0	0	0	-	-	-
	Total	13,042	23,869	35,232	36,029	19,691	40,464	64,510	55,280	69,654	64,819
Other groundfish	Japan	2,239	4,378	2,984	4,182	9,227	29,617	32,370	39,911	47,491	42,531
	USSR	-	-	19,074	6,277	6,068	3,879	78,523	15,915	12,770	12,314
	ROK	0	0	-	-	-	-	-	-	-	-
	Others	0	0	0	0	0	0	0	0	-	-
	Total	2,239	4,378	22,058	10,459	15,295	33,496	110,893	55,826	60,261	54,845
All groundfish total	Japan	377,972	716,706	877,676	1,035,822	1,446,626	1,781,925	1,843,772	1,725,596	1,487,113	1,278,103
	USSR	81,800	123,876	98,761	162,075	159,627	384,607	362,959	331,163	409,677	303,937
	ROK	0	0	1,200	5,000	5,000	10,000	9,200	3,100	26,000	3,438
	Others	0	0	0	0	0	0	0	0	-	-
All-nation total		459,772	840,582	977,637	1,202,897	1,611,253	2,176,532	2,215,931	2,059,859	1,922,790	1,585,478

Table 1.--Continued.

Species	Nation	1976	1977	1978	1979
Pollock	Japan	986,696	774,450	783,048	749,229
	USSR	175,539	63,382	91,647	58,880
	ROK	84,987	39,895	59,570	83,658
	Others	-	1,334	3,057	22,114
	Total	1,247,222	879,061	967,322	913,881
Pacific cod	Japan	32,009	33,141	41,234	28,532
	USSR	17,756	177	419	1,956
	ROK	716	-	859	2,446
	Others	-	2	62	47
	Total	50,481	33,320	42,574	32,981
Pacific ocean perch and other rockfish	Japan	3,300	7,771	4,291	6,194
	USSR	12,124	90	5	2
	ROK	578	478	560	154
	Others	-	0	3	3
	Total	16,002	8,339	4,859	6,353
Sablefish	Japan	2,815	2,801	909	1,050
	USSR	29	0	0	27
	ROK	115	9	173	194
	Others	-	53	5	5
	Total	2,959	2,863	1,087	1,276
Yellowfin sole	Japan	52,673	58,190	62,736	56,824
	USSR	2,908	283	76,300	40,271
	ROK	655	-	69	1,919
	Others	-	-	1	3
	Total	56,236	58,473	139,106	99,017
Rock sole	Japan	8,598	5,025	6,671	4,496
	USSR	1,328	265	354	320
	ROK	107	-	13	194
	Others	-	-	0	0
	Total	10,033	5,290	7,038	5,010
Flathead sole	Japan	7,379	7,057	13,446	5,588
	USSR	795	531	1,152	724
	ROK	90	-	19	195
	Others	-	-	1	0
	Total	8,264	7,588	14,618	6,507
Alaska plaice	Japan	3,519	3,119	4,716	4,707
	USSR	102	0	4,752	10,853
	ROK	44	-	0	9
	Others	-	-	6	0
	Total	3,665	3,119	9,474	15,569
Pacific halibut	Japan	88	-	0	0
	USSR	58	-	0	0
	ROK	-	-	0	0
	Others	-	2	4	0
	Total	146	2	4	0
Arrowtooth flounder	Japan	1,717	8,213	7,475	5,288
	USSR	16,132	3,294	2,576	948
	ROK	2	-	91	1,680
	Others	-	-	9	5
	Total	17,851	11,507	10,151	7,921
Greenland turbot	Japan	51,677	28,248	40,643	34,089
	USSR	8,867	2,039	1,543	626
	ROK	425	-	28	268
	Others	-	-	47	15
	Total	60,969	30,287	42,261	34,998
Other groundfish	Japan	13,527	33,742	47,582	35,452
	USSR	12,294	624	11,020	7,088
	ROK	322	1,445	2,935	6,931
	Others	-	91	-	43
	Total	26,143	35,902	61,537	49,514
All groundfish total	Japan	1,163,998	961,757	1,012,751	931,449
	USSR	247,932	70,685	189,768	121,695
	ROK	88,041	41,827	64,317	97,648
	Others	-	1,482	3,195	22,235
All-nation total		1,499,971	1,075,751	1,270,031	1,173,027

Table 2 .--Foreign catches of groundfish in the Aleutian Island region (170°W to 170°E) by calendar year, 1962-79.[1/][2/]

Species	Nation	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Pollock	Japan	6	1,359	543	663	1,102	1,359	2,680	512	178	624
	USSR	--	--	--	--	--	--	--	726	9,490	2,535
	ROK	0	0	0	0	0	--	--	--	--	--
	Others[3/]	0	0	0	0	0	0	0	0	0	0
	TOTAL	6	1,359	543	663	1,102	1,359	2,680	1,238	9,668	3,159
Pacific cod	Japan	26	601	241	451	154	274	289	220	283	425
	USSR	--	--	--	--	--	--	--	--	--	1,653
	ROK	0	0	0	0	0	--	--	--	--	--
	Others	0	0	0	0	0	0	0	0	0	0
	TOTAL	26	601	241	451	154	274	289	220	283	2,078
Pacific ocean perch and other rockfish	Japan	214	7,636	29,377	38,204	28,733	10,285	23,889	15,641	14,173	14,809
	USSR	--	20,000	61,000	71,000	57,700	45,720	26,584	23,172	53,274	7,190
	ROK	0	0	0	0	0	--	--	--	--	--
	Others	0	0	0	0	0	0	0	0	0	0
	TOTAL	214	27,636	90,377	109,204	86,433	56,005	50,473	38,813	67,447	21,999
Sablefish	Japan	--	639	1,496	1,224	1,321	1,608	1,676	1,667	1,246	2,700
	USSR	--	--	--	--	--	--	--	--	--	170
	ROK	0	0	0	0	0	--	--	--	--	--
	Others	0	0	0	0	0	0	0	0	0	0
	TOTAL	--	639	1,496	1,224	1,321	1,608	1,676	1,667	1,246	2,870
Atka mackerel	Japan	--	--	--	--	--	--	--	--	--	--
	USSR	--	--	--	--	--	--	--	--	--	--
	ROK	0	0	0	0	0	--	--	--	--	--
	Others	0	0	0	0	0	0	0	0	0	0
	TOTAL	--	--	--	--	--	--	--	--	--	--
Yellowfin sole	Japan	--	2	61	92	98	18	6	20	9	1
	USSR	--	--	--	--	--	--	--	--	--	--
	ROK	0	0	0	0	0	--	--	--	--	--
	Others	0	0	0	0	0	0	0	0	0	0
	TOTAL	--	2	61	92	98	18	6	20	9	1
Rock sole	Japan	--	27	152	147	82	25	17	2	2	1
	USSR	--	--	--	--	--	--	--	--	--	--
	ROK	0	0	0	0	0	--	--	--	--	--
	Others	0	0	0	0	0	0	0	0	0	0
	TOTAL	--	27	152	147	82	25	17	2	2	1
Flathead sole	Japan	--	14	43	128	25	32	186	2	11	16
	USSR	--	--	--	--	--	--	--	--	--	--
	ROK	0	0	0	0	0	--	--	--	--	--
	Others	0	0	0	0	0	0	0	0	0	0
	TOTAL	--	14	43	128	25	32	186	2	11	16
Alaska plaice	Japan	--	--	45	41	--	--	--	--	--	--
	USSR	--	--	--	--	--	--	--	--	--	--
	ROK	0	0	0	0	0	--	--	--	--	--
	Others	0	0	0	0	0	0	0	0	0	0
	TOTAL	--	--	45	41	--	--	--	--	--	--
Halibut	Japan	1	67	681	1,268	163	215	333	331	350	387
	USSR	--	--	--	--	--	--	--	--	--	--
	ROK	0	0	0	0	0	--	--	--	--	--
	Others	0	0	0	0	0	0	0	0	0	0
	TOTAL	1	67	681	1,268	163	215	333	331	350	387
Arrowtooth flounder	Japan										
	USSR									274	581
	ROK		CATCHES OF ARROWTOOTH FLOUNDER COMBINED WITH							--	--
	Others		GREENLAND TURBOT UNTIL 1970							--	--
	TOTAL									0	0
										274	581
Greenland turbot	Japan	--	7	504	300	63	394	213	228	285	1,750
	USSR	--	--	--	--	--	--	--	--	--	--
	ROK	0	0	0	0	0	--	--	--	--	--
	Others	0	0	0	0	0	0	0	0	0	0
	TOTAL	--	7	504	300	63	394	213	228	285	1,750
Other groundfish	Japan	--	513	66	768	131	563	318	2,361	1,181	2,753
	USSR	--	--	--	--	--	7,979	8,630	727	9,490	220
	ROK	0	0	0	0	0	--	--	--	--	--
	Others	0	0	0	0	0	0	0	0	0	0
	TOTAL	--	513	66	768	131	8,542	8,948	3,088	10,671	2,973
All groundfish total	Japan	247	10,865	33,209	43,286	31,872	14,773	29,607	20,984	17,992	24,047
	USSR	--	20,000	61,000	71,000	57,700	53,699	35,214	24,625	72,254	11,768
	ROK	0	0	0	0	0	--	--	--	--	--
	Others	0	0	0	0	0	0	0	0	0	0
All nations total		247	30,865	94,209	114,286	89,572	68,472	64,821	45,609	90,246	35,815

1/ Catch statistics up to 1963 from Forrester et al. 1978 and for 1964-78 from data on file, Northwest and Alaska Fisheries Center, with the following exceptions: Pacific ocean perch and other rockfish - USSR catches for 1963-66 from Chikuni 1975; all flounders except halibut - all national catches, 1963-76 from Wakabayashi and Bakkala 1978.

2/ 0 indicates no fishing, -- indicates fishing, but no catch reported.

3/ Other nations are Taiwan up to 1978 and Taiwan and Poland in 1979.

Table 2.--Continued.

Species	Nation	1972	1973	1974	1975	1976	1977	1978	1979
Pollock	Japan	571	848	1,318	1,519	1,015	5,667	5,025	8,047
	USSR	866	9,628	21,346	12,262	3,673	1,618	1,193	1,412
	ROK	--	--	--	--	344	325	64	45
	Others	0	0	--	--	--	15	0	0
	TOTAL	1,437	10,476	22,664	13,781	5,032	7,625	6,282	9,504
Pacific cod	Japan	435	566	1,334	2,581	3,862	2,066	3,165	5,171
	USSR	--	411	45	257	312	100	120	414
	ROK	--	--	--	--	16	--	6	6
	Others	0	0	--	--	--	--	0	0
	TOTAL	435	977	1,379	2,838	4,190	2,166	3,291	5,591
Pacific ocean perch and other rockfish	Japan	8,789	9,793	22,317	9,528	11,204	12,708	10,428	16,385
	USSR	24,595	3,017	824	8,147	6,951	785	231	30
	ROK	--	--	--	--	33	87	246	149
	Others	0	0	--	--	--	2	0	0
	TOTAL	33,384	12,810	23,141	17,675	18,188	13,582	10,905	16,564
Sablefish	Japan	3,308	2,690	2,451	1,624	1,569	673	728	626
	USSR	269	162	14	79	61	--	0	0
	ROK	--	--	--	--	71	86	22	163
	Others	0	0	--	--	--	--	0	0
	TOTAL	3,577	2,852	2,465	1,703	1,701	759	750	789
Atka mackerel	Japan	--	--	--	--	5	585	673	961
	USSR	4,515	1,604	1,377	12,078	20,092	20,970	22,065	20,205
	ROK	--	--	--	--	--	--	0	0
	Others	0	0	--	--	0	--	0	0
	TOTAL	4,515	1,604	1,377	12,078	20,097	21,555	22,738	21,166
Yellowfin sole	Japan	--	--	--	--	0	98	668	1,309
	USSR	--	--	--	--	--	--	0	0
	ROK	--	--	--	--	--	--	0	0
	Others	0	0	--	--	--	--	0	0
	TOTAL	--	--	--	--	0	98	668	1,309
Rock sole	Japan	5	2	36	3	24	75	806	864
	USSR	--	--	--	--	--	44	8	0
	ROK	--	--	--	--	--	--	0	0
	Others	0	0	--	--	--	--	0	0
	TOTAL	5	2	36	3	24	119	814	864
Flathead sole	Japan	4	24	41	1	7	39	240	270
	USSR	--	--	--	--	--	1	0	0
	ROK	--	--	--	--	--	--	0	0
	Others	0	0	--	--	--	--	0	0
	TOTAL	4	24	41	1	7	40	240	270
Alaska plaice	Japan	--	--	--	--	--	--	1	3
	USSR	--	--	--	--	--	--	0	0
	ROK	--	--	--	--	--	--	0	0
	Others	0	0	--	--	--	--	0	0
	TOTAL	--	--	--	--	--	--	1	3
Halibut	Japan	357	245	363	145	15	1	0	0
	USSR	1	4	4	3	2	--	0	0
	ROK	--	--	--	--	--	--	0	0
	Others	0	--	0	--	--	--	0	0
	TOTAL	358	249	367	148	17	1	--	0
Arrowtooth flounder	Japan	1,323	3,705	3,195	784	1,370	2,015	1,780	6,436
	USSR	--	--	--	--	--	20	2	0
	ROK	--	--	--	--	5	--	0	0
	Others	0	0	0	--	--	--	0	0
	TOTAL	1,323	3,705	3,195	784	1,375	2,035	1,782	6,436
Greenland turbot	Japan	12,874	8,666	8,788	2,970	1,955	2,449	4,765	6,411
	USSR	--	--	--	--	112	4	0	0
	ROK	--	--	--	--	6		1	0
	Others	0	0	0	--	--		0	0
	TOTAL	12,874	8,666	8,788	2,970	2,073	2,453	4,766	6,411
Other groundfish	Japan	3,028	2,630	7,998	8,110	6,250	11,504	11,701	15,990
	USSR	19,419	1,614	1,726	178	562	4,662	88	1,876
	ROK	--	--	--	--	241	0	647	536
	Others	0	0	0	--	--	4	0	0
	TOTAL	22,447	4,244	9,724	8,288	7,053	16,170	12,436	18,402
All groundfish total	Japan	30,694	29,169	47,841	27,265	27,276	37,880	39,980	62,473
	USSR	49,665	16,440	25,336	33,004	31,765	28,204	23,707	23,937
	ROK	--	--	--	--	716	498	986	899
	Others	0	0	--	--	--	21	0	0
All nations total		80,359	45,609	73,177	60,269	59,757	66,603	64,673	87,309

Billing Code 3510-22

DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

50 CFR Parts 611 and 675

Bering Sea and Aleutian Islands Area Groundfish Fishery

AGENCY: National Oceanic and Atmospheric Administration (NOAA), DOC.

ACTION: Notice of proposed rulemaking; approval and notice of availability of an amendment to the fishery management plan.

SUMMARY: NOAA issues proposed rules and a notice of initial approval and availability of Amendment 1 to the fishery management plan for groundfish in the Bering Sea and Aleutian Islands. This amendment establishes a multi-year, multi-species optimum yield for the Bering Sea and Aleutian Islands groundfish complex from which domestic annual harvest, reserves, and total allowable level of foreign fishing are derived. This management approach is proposed in response to growing concern that the species specific management concept of the fishery management plan in its current form does not provide the flexibility necessary for efficient management of the groundfish resource.

The complex-wide management approach proposed in this amendment should be administratively less cumbersome than the approach currently prescribed in the fishery management plan and will allow more timely implementation of management decisions made in response to changes in the

condition of the groundfish resource. A new schedule for the apportionment of groundfish reserves to domestic annual harvest and total allowable level of foreign fishing is also proposed. This will be more responsive than the current schedule to the seasonal progress of the domestic fishery and will facilitate advance planning by foreign operators. Amendment 1 will change restrictions on the domestic trawl fishery operating in the Bristol Bay Pot Sanctuary and the Winter Halibut Savings Area to encourage domestic groundfish development while still protecting the Pacific halibut resource. It will also increase the authority of the Director of the National Marine Fisheries Service, Alaska Region, to issue in-season field orders to avoid gear conflicts and for conservation purposes. Amendment 1 also designates two new areas between 170° W. and 172° W. longitude where, due to the narrowness of the Continental Shelf, foreign fishing will be permitted seaward of three miles from the baseline used to measure the U.S. territorial sea. Lastly, Amendment 1 revises appendices and annexes to the FMP to reflect changes in the FMP itself and to incorporate the most recent scientific information.

DATES: Comments on the amendment and proposed rule are invited until (insert date _____ days after publication in the Federal Register).

ADDRESSES: Comments may be mailed to Robert W. McVey, Director, Alaska Region, National Marine Fisheries Service, P.O. Box 1668, Juneau, Alaska 99802, or delivered to Room 453, Federal Building, 709 West Ninth Street, Juneau, Alaska.

FOR FURTHER INFORMATION CONTACT: Robert W. McVey (address above), telephone (907) 586-7221. Copies of the amendment may be obtained from

the North Pacific Fishery Management Council, P.O. Box 3136 DT, Anchorage, Alaska 99510, telephone (907) 274-4563.

SUPPLEMENTARY INFORMATION:

On March 23, 1979, the North Pacific Fishery Management Council (Council) approved the Fishery Management Plan for the Goundfish Fisheries of the Bering Sea and Aleutian Islands Area (FMP) and subsequently submitted it to the Assistant Administrator for Fisheries, NOAA, (Assistant Administrator) for approval and implementation under the Magnuson Fishery Conservation and Management Act, Public Law 94-265, as amended (Magnuson Act). The Assistant Administrator tentatively approved the FMP on October 19, 1979, and published it and proposed implementing rules for public comment in the Federal Register on November 19, 1979, 44 FR 66356. Public comments received indicated that the environmental impact statement (EIS) on approval and implementation of the FMP did not adequately address certain biological issues. A revised draft EIS on both the original FMP and proposals for its amendment was released for public review on September 19, 1980.

Three amendments to the FMP were subsequently developed by the Council. Amendment 1a was approved by the Council on March 27, 1981, and was submitted to the Assistant Administrator on June 3, 1981. This amendment limited the prohibited species catch of chinook salmon incidental to foreign groundfish trawl fisheries to 65,000 fish. Amendment 2 was approved by the Council on September 24, 1980, and was submitted to the

Assistant Administrator on March 23, 1981. It changed the domestic annual harvest (DAH) and total allowable level of foreign fishing (TALFF) amounts for yellowfin sole and other flatfish and the optimum yield (OY), DAH, and reserve amounts for Pacific cod. "Reserves" are portions of OY that are set aside for apportionment to DAH and TALFF during the fishing year in accordance with the needs of the domestic groundfish fisheries. Amendments 1a and 2 were based on similar amendments to the preliminary management plan for the Trawl Fisheries and Herring Gillnet Fishery of the Bering Sea and Northeast Pacific (PMP) which will be superseded by the FMP upon its implementation by the Assistant Administrator.

Amendment 1 to the FMP was approved by the Council on March 27, 1981, and makes the following changes to the management regime prescribed in the FMP: (1) The current OY specifications for individual groundfish species are replaced by a single OY for the entire Bering Sea/Aleutians groundfish resource, or "complex," with total allowable catch (TAC) figures specified annually for each species; (2) A new schedule is established for the apportionment during the fishing year of reserves to TALFF and DAH, and of DAH that will not be harvested by United States fishing vessels to TALFF; (3) Domestic fishing restrictions in the Bristol Bay Pot Sanctuary and the Winter Halibut Savings Area are changed to allow year-round trawling; (4) Two new areas in the Bering Sea where foreign fishing will be allowed seaward of three miles from the baseline used to measure the U.S. territorial sea are established; (5) The authority of the Director of the National Marine Fisheries Service (NMFS), Alaska Region (Regional Director), to issue field orders is expanded; and (6) Appendices and

annexes to the FMP are revised to reflect the best scientific information currently available.

OY of the Groundfish Complex

Amendment 1 substitutes a single OY specification for the entire Bering Sea/Aleutians groundfish complex for the single-species OY specifications currently contained in the FMP. Commercial catch statistics and resource assessment surveys conducted by NMFS show that the groundfish complex of the Bering Sea and Aleutians can be treated as a distinct fishery management unit. The complex has more than ten commercially important species and many others of lesser or no commercial importance. It forms a large subsystem of the Bering Sea ecosystem with intricate interrelationships involving predators, prey, competitors, and the environment. The current practice of treating each species group as a management unit in relative isolation from other species groups ignores these demonstrated interrelationships among the various groups, and limits the managing agencies' ability to respond quickly to fluctuations in the composition of the groundfish complex. Therefore, the productivity and maximum sustainable yield (MSY) of groundfish species can best be determined for the groundfish complex as a unit, rather than for each of many individual species groups. OY is determined by adjusting MSY on the basis of relevant social and economic factors, in addition to short-term biological factors.

The most current information available shows the MSY of the groundfish complex to fluctuate from year to year within the range of 1.7 to 2.4

million metric tons. This amount was derived by adding together the MSY's of individual species and species groups. These MSY's were estimated from a number of production models; from the examination of statistical trends relative to stock condition; and from the assessment of the overall condition of the groundfish stocks which takes into account statistical trends and population dynamics theories and models. The techniques used to analyze the data varied considerably from species to species, depending on the quality and completeness of the available data bases.

The accepted biological catch (ABC) is determined by adjusting MSY to reflect short-term biological factors. The ABC for the Bering Sea/ Aleutians groundfish complex is set at 85 percent of the MSY or 1.4 to 2.0 million metric tons. The deviation from the MSY reflects the combined influence of several factors that stem from the quality of the data used, condition of stocks, and inadequacies in population and ecosystem models. The ABC range reflects the foreseeable variations in abundance levels of the various components of the groundfish complex induced by environmental factors and by predator/prey relationships. These variations, in turn, will affect the production from individual stocks, as well as the entire complex, that will be available for harvest from year to year.

Amendment 1 sets the OY of the Bering Sea/Aleutians groundfish complex equal to the ABC of 1.4 to 2.0 million metric tons. This OY range approximates reported harvest levels by the Bering Sea/Aleutians groundfish fishery over the past 15 years. During this time, some groundfish

stocks have declined, primarily during the late 1960's and early 1970's when, due to insufficient monitoring of the groundfish catch, annual harvests may have been much greater than the maximum reported catch of 2.4 million metric tons. Subsequent improvement of catch and effort data and a more conservative management regime resulted in the recovery of many of the affected stocks, primarily pollock and yellowfin sole. In addition, information from catch data and resource assessments indicate that the groundfish fishery has resulted in a change of species and stock composition in the Bering Sea. The most current information available indicates that the OY range proposed in Amendment 1 is compatible with these changes and the present status of the Bering Sea/ Aleutians groundfish resource.

Total Allowable Catch

Each year, the OY for the groundfish complex will be divided into total allowable catch (TAC) figures for the individual species groups. At the beginning of each fishing year the lower value of the OY range, 1.4 million metric tons, will be authorized for harvest. The initial TAC for each species or species group will be obtained by multiplying this amount by a "production factor," which is defined as the long term production of an individual species or species group relative to that of the entire groundfish complex (see Table 1). These production factors are estimated by NMFS scientists as weighted averages of three yield estimates: (1) the proportion each species or species group contributed to commercial catches during 1969-79; (2) the equilibrium yield (EY) of

Table 1. Initial Total Allowable Catch (TAC), Domestic Annual Harvest (DAH), and Total Allowable Level of Foreign Fishing (TALFF) Authorized for the Bering Sea and Aleutian Islands Area Groundfish Fishery

Species Group	Areas 1/	Production 2/ Factor	Initial 3/ TAC	Initial 4/ Reserve	Initial DAH	Initial TALFF
Pollock	I, II	.6800 5/	952,000	95,200	19,550	837,250
	III, IV	.0230 5/	32,200	3,220	--	28,980
Pacific Ocean Perch	I, II, III	.0025 5/	3,500	350	1,380	1,770
	IV	.0025 5/	3,500	350	1,380	1,770
Other Rockfish	I, II, III	.0050	7,000	700	775	5,525
	IV	.0050	7,000	700	775	5,525
Sablefish	I, II, III	.0015 5/	2,100	210	930	960
	IV	.0005 5/	700	70	470	160
Pacific cod		.0500	70,000	7,000	43,265	19,735
Yellowfin sole		.0600	84,000	8,400	26,200	49,400
Turbots		.0400	56,000	5,600	1,075	49,325
Other flatfish 6/		.0500	70,000	7,000	4,200	58,800
Atka mackerel	IV	.0300	42,000 7/	4,200	100	29,200
Squid		.0200	28,000 7/	2,800	50	16,650
Other species		.0300	42,000	4,200	2,000	35,800
Total		1.0000	1,400,000	140,000	102,150	1,140,850

1/ Statistical Areas.

2/ Long-term production of individual species groups relative to that of the entire groundfish complex.

3/ Determined by multiplying the total initial TAC, which is fixed at 1.4 million metric tons, times the production factor.

4/ Ten percent initial TAC.

5/ Depleted stocks, production factor set at 50 percent long-term value; pollock production factor increased by corresponding amount to rectify total.

6/ Excluding Pacific halibut.

7/ Reserve for correction of operational problems (17,000 mt) taken from Atka mackerel and squid categories (8,500 mt each) because actual catches have not approached initial species TAC.

each species or species group during 1975-79 as derived from status of stocks analyses; and (3) the proportion each species contributed to the equilibrium biomass as estimated from an ecosystem model which took into consideration predator/prey interrelations of all fish, mammals, and birds within the Bering Sea/Aleutians ecosystem. EY is that level of harvest at which the size or "biomass" of a fish stock will remain constant.

The production factors for Pacific ocean perch and sablefish are reduced by 50 percent to encourage rebuilding of stocks of these species, while permitting them to be caught incidentally to the harvest of other species. The production factor for pollock is increased by corresponding amounts. Because distinct exploitable stocks of pollock, Pacific ocean perch, and sablefish have been identified in the Bering Sea and Aleutians, separate production factors and TAC's are specified for each of these stocks in the area(s) of occurrence.

Ten percent of the initial TAC assigned to each species or species group (for a total of 140,000 metric tons) will be designated as an initial reserve for domestic fishery expansion (see Table 1). Due to the small harvests of these species to date, the initial TAC's for both Atka mackerel and squid will be further reduced by 8,500 metric tons to create a 17,000 metric ton "reserve for the correction of operational problems" (operational reserve). This reserve will be distributed among species or species groups and among nations during the fishing year at the discretion of the Regional Director to accommodate unforeseen increases in the harvest of particular species or species groups that could lead to premature closure of the entire fishery to a nation, leaving other species and species groups underutilized. This reserve is so small that its allocation is not expected to have any significant biological effect.

The remainder of each initial TAC, or a total of 1,243,000 metric tons, will be available for immediate harvest by the groundfish fishery and will be apportioned between initial DAH and initial TALFF in the amounts specified in Table 1.

The Regional Director, after consultation with the Council, will determine the final TAC for each groundfish species or species group by April 1. The sum of these final TAC's will not exceed the higher value of the OY range, 2.0 million metric tons. Derivation of the final TAC's will be based upon the most recent information available on year class strengths and status of stocks as determined from analyses of data from NMFS resource assessments and commercial catches. A final reserve for domestic fishery expansion composed of 10 percent of each final TAC will then be specified. Those portions of each final TAC that have not been apportioned to reserve, initial DAH, or initial TALFF will then be apportioned to DAH or TALFF as deemed necessary by the Regional Director upon consideration of status of stocks, the progress of the domestic groundfish fishery, and any other information deemed pertinent by him. The 17,000 metric ton operational reserve will remain unchanged.

The complex-wide management regime proposed in Amendment 1 will enable the Bering Sea/Aleutians groundfish resource to be managed efficiently, using the most current information available on status of stocks. Under the FMP in its current form, the OY specifications for individual species and species groups can be changed only through the lengthy FMP amendment process. Amendment 1 permits similar adjustments to be made much more readily as new information becomes available.

Reapportionment of Reserve and Unutilized DAH

At any time, the Regional Director may reassess DAH and apportion to DAH any amounts from the reserve for domestic fishery expansion that are needed in order to prevent a closure of the domestic fisheries. After consultation with the Council, the Regional Director will apportion to TALFF all or part of the reserve for domestic fishery expansion according to the following schedule: no more than 40 percent by the beginning of April; no more than 80 percent by the beginning of June, and the remainder by the beginning of August. Any DAH that the Regional Director determines will not be harvested by United States fishing vessels during the rest of the fishing year shall be apportioned to TALFF at the beginning of August. This reserve apportionment schedule will allow the Council and the Regional Director to monitor the progress of the domestic fishery and ensure availability of groundfish for harvest by U.S. fishermen. The apportionment schedule should also facilitate advance planning by foreign operators who utilize the Bering Sea groundfish resource.

Domestic Fishing Area Limitations

Amendment 1 modifies the restrictions on domestic trawling in the Bristol Bay Pot Sanctuary and the Winter Halibut Savings Area (Areas A and B in Figure 1), and reduces the size of the latter area. The FMP currently states that (1) domestic trawling in the Bristol Bay Pot Sanctuary is permitted only during open seasons of the U.S. Bering Sea crab fisheries; (2) domestic trawling in the Winter Halibut Savings Area

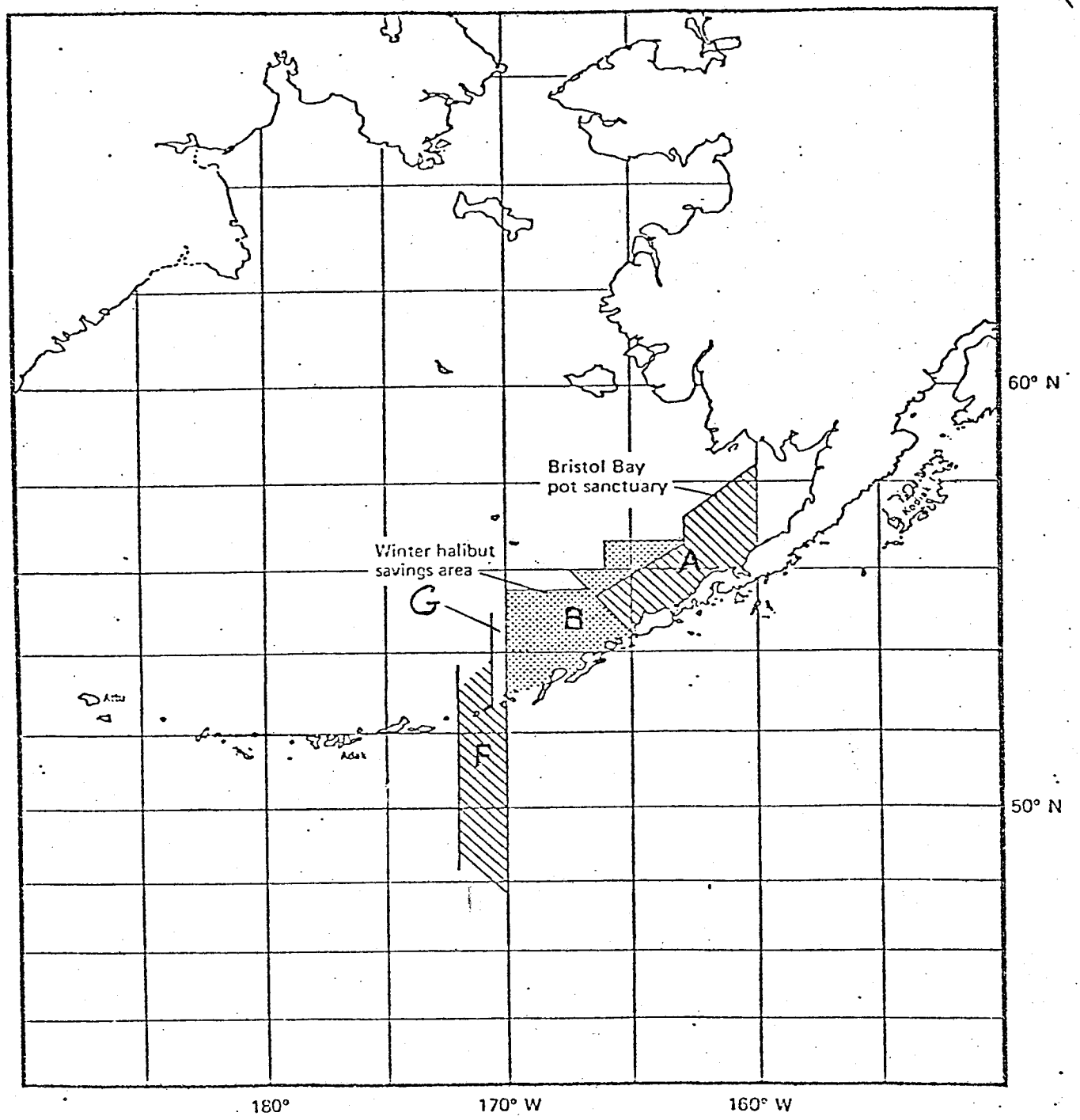


Figure 1.--Location of the Bristol Bay Pot Sanctuary, the Winter Halibut Savings Area and Areas F and G, as described in Amendment 1.

is permitted from December 1 through May 31 until the domestic trawl catch reaches 2,000 metric tons; and (3) domestic longlining in the Winter Halibut Savings Area is permitted landward of the 500 meter isobath until the total U.S. longline catch (excluding Pacific halibut) reaches 2,000 metric tons. These restrictions were initially imposed on the domestic groundfish fishery in order to reduce the mortality of juvenile halibut while still allowing the fishing of groundfish for crab bait and some development of a domestic food fishery. Subsequent growth of the domestic groundfish fishery has been accompanied by protests from domestic fishermen that current provisions are unreasonable and would hinder further development of the domestic groundfish fishery.

In view of these protests, Amendment 1 proposes to (1) eliminate the "Misty Moon" grounds south of the Pribilof Islands from the Winter Halibut Savings Area; (2) allow an experimental year-round domestic trawl fishery in the Winter Halibut Savings Area that will be closely monitored by observers; and (3) permit year-round domestic trawling in the Bristol Bay Pot Sanctuary that will be subject to a one percent incidental catch rate limit of Pacific halibut. This catch rate limit will be imposed upon domestic vessels involved in a "species venture," which is defined to be any of the following: (1) a joint venture using a foreign processor of a particular flag and controlled by either a particular American partner or a foreign entity directly; (2) an individual factory trawler operation; (3) a domestic joint venture with at-sea processing by a particular processor/buyer; or (4) trawl-caught deliveries to a particular buyer. Upon achieving an initial 20,000

metric ton catch, if a species venture's incidental catch of Pacific halibut exceeds one percent by weight of total catch, the species venture shall be restricted to pelagic trawl gear for the remainder of the fishing year when trawling in the Bristol Bay Pot Sanctuary. If a species venture's incidental catch of Pacific halibut is one percent or less, then the species venture may continue bottom trawling subject to the one-percent incidental catch of Pacific halibut restriction for each additional 20,000 metric ton catch level achieved.

These management measures proposed for the domestic trawl fishery will control incidental catches and mortality of juvenile halibut, which are known to occur in winter concentrations in the Bristol Bay Pot Sanctuary and the Winter Halibut Savings Area, while allowing some expansion in the traditional crab-bait trawl fishery and the development of a domestic groundfish fishery for human consumption.

Foreign Fishing Area Limitations

Amendment 1 specifies the following two new areas (Figure 1) where foreign fishing will be permitted seaward of three nautical miles from the baseline used to measure the U.S. territorial sea: (1) Area F--bounded by 170°00' W. and 172°00'W. longitude on the south side of the Aleutians and by 170°30' W. and 172°00'W. longitude on the north side of the Aleutians; and (2) Area G--north of the Aleutians between 170°00' W. and 170°30' W. longitude. Foreign trawling will be permitted only in Area F, whereas foreign longline operations will be permitted in both

Areas F and G. Foreign trawling is prohibited in Area G to avoid gear conflicts and ground preemption problems between U.S. crab fishermen who utilize the area and foreign trawl fleets. Foreign fishing seaward of three miles from the baseline is being allowed in Areas F and G because of the narrow breadth of the Continental Shelf in these areas and the impracticability of fishing for groundfish outside of twelve miles.

Management Authority of the Regional Director

Amendment 1 provides the Regional Director with the authority to issue field orders for adjusting time/area closures for conservation reasons. This authority will allow the Regional Director to take immediate action to adjust fishing areas or seasons if unanticipated adverse or favorable stock conditions are revealed in season.

Amendment 1 also establishes the authority of the Regional Director or his designee to issue field orders to impose time/area restrictions upon foreign vessels to resolve serious gear conflicts between foreign fishing operations and domestic fixed gear fishing operations. Issuance of such orders would follow the confirmation of a gear conflict situation and refusal of the foreign vessels involved to depart voluntarily upon request.

FMP Information Base

Amendment 1 substitutes a new Annex I to the FMP which summarizes the latest information on status of stocks of various species or species

groups as of the time Amendment 1 was adopted by the Council. This Annex serves two main purposes: (1) to provide readers and reviewers of the FMP with knowledge of its factual context; and (2) to illustrate the manner in which new data obtained in future years will be used to obtain species and species group specific MSY, EY, and ABC estimates which will form the basis for specifications of TAC's under the plan. The specific MSY, EY, and ABC estimates contained in Annex 1 apply to a period before actual implementation of Amendment 1, and do not govern the use of data obtained after approval of Amendment 1 to obtain TAC specifications under the standards and procedures prescribed by the Amendment.

Amendment 1 also updates other appendices and annexes to the FMP to reflect the most current scientific information as of the time of the Amendment's adoption. Like the changes to Annex I, these changes also have no regulatory effect, and are provided for informational and illustrative purposes.

Classification

The Assistant Administrator has determined that approval and implementation of Amendment 1 constitutes a major federal action significantly affecting the quality of the human environment and requires the preparation of an environmental impact statement (EIS) under the National Environmental Policy Act. The EIS written for the FMP also addresses Amendment 1 and is available from the National Marine Fisheries Service at the address set forth above.

The Administrator of the National Oceanic and Atmospheric Administration (Administrator) has determined that this amendment and its implementing rules are not a "major rule" requiring a regulatory impact analysis under Executive Order 12291, because they will not result in an annual effect on the economy of $100 million or more; will not result in a major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions; and will not result in significant adverse effects on competiton, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets. By providing more access to the Bristol Bay Pot Sanctuary and the Winter Halibut Savings Area for U.S. trawlers, Amendment 1 will encourage development of the domestic groundfish industry. This amendment can, therefore, be expected to encourage the expansion of the United States fishing industry, and can thus be expected to reduce costs for consumers and producers in that industry and to enhance the competitive position of the United States fishing industry relative to the fishing industries of other nations. The Administrator has also certified that this proposed rule will not have a significant effect on a substantial number of small entities, and thus does not require preparation of a regulatory flexibility analysis under 5 USC sections 603 and 604 of the Regulatory Flexibility Act.

The Assistant Administrator has determined that approval and implementation of this amendment will be carried out in a manner that is consistent, to the maximum extent practicable, with the Alaska Coastal Management Program, as required by Section 307(c)(1) of the Coastal Zone Management

Act of 1972 and its implementing regulations, 15 CFR, Part 930, Subpart C. This determination has been submitted to the Office of the Governor of the State of Alaska. He has further determined that Amendment 1 to the FMP is necessary and appropriate for the conservation and management of fishery resources in the Bering Sea/Aleutian Islands region, and that it is consistent with the National Standards in Section 301 of the Magnuson Act, with other provisions of the Magnuson Act, and with other applicable law. He has, therefore, under Sections 304 and 305 of the Magnuson Act, approved Amendment 1 and proposed regulations to implement the amendment.

This rule does not contain a collection of information requirement, and does not involve any agency in conducting or sponsoring the collection of information under the Paperwork Reduction Act of 1980 (44 U.S.C. et seq.).

Date:

Robert K. Crowell
Deputy Executive Director
National Marine Fisheries Service

For the reasons set forth in the preamble, 50 CFR Parts 611 and 675 are proposed to be amended as follows:

1. The authority citation for Part 611 reads as follows:

AUTHORITY: Sections 201 and 305, Public Law 94-265, 90 Stat. 339, 354-55 (16 USC 1821 and 1855).

2. In §611.93, paragraphs (b)(1)(i), (b)(2)(i), (b)(2)(ii), (b)(2)(iii)(F), (b)(3)(ii)(A), (c)(2)(iii), (c)(3)(i), and (c)(3)(ii) are revised; and paragraphs (c)(2)(vi), (c)(4), (c)(5), and (f) are added, as follows:

§611.93 Bering Sea and Aleutian Islands fishery

* * * * *

(b) Authorized fishery. - (1) TALFF's and Reserves.

(i) On January 1 of each fishing year, 1,400,000 metric tons of groundfish are authorized for harvest during that year by United States and foreign fishing vessels. Ten percent of this amount is apportioned to an initial reserve for domestic fishery expansion and 17,000 metric tons is apportioned to a reserve for correction of operational problems. The remaining 1,243,000 metric tons are divided among initial total allowable catch (TAC) figures for each species or species group, and apportioned to domestic annual harvest (DAH) and total allowable level of foreign fishing (TALFF), as specified in Table 1 of this section. On April 1 of each year, the Regional Director, after consultation with the North Pacific Fishery Management Council (Council), may authorize by rule additional amounts of each groundfish species or species group for

Table 1. Initial Total Allowable Catch (TAC), Domestic Annual Harvest (DAH), and Total Allowable Level of Foreign Fishing (TALFF) Authorized for the Bering Sea and Aleutian Islands Area Groundfish Fishery

Species Group	Areas 1/	Production 2/ Factor	Initial 3/ TAC	Initial 4/ Reserve	Initial DAH	Initial TALFF
Pollock	I, II	.6800 5/	952,000	95,200	19,550	837,250
	III, IV	.0230 5/	32,200	3,220	--	28,980
Pacific Ocean Perch	I, II, III	.0025 5/	3,500	350	1,380	1,770
	IV	.0025 5/	3,500	350	1,380	1,770
Other Rockfish	I, II, III	.0050	7,000	700	775	5,525
	IV	.0050	7,000	700	775	5,525
Sablefish	I, II, III	.0015 5/	2,100	210	930	960
	IV	.0005 5/	700	70	470	160
Pacific cod		.0500	70,000	7,000	43,265	19,735
Yellowfin sole		.0600	84,000	8,400	26,200	49,400
Turbots		.0400	56,000	5,600	1,075	49,325
Other flatfish 6/		.0500	70,000	7,000	4,200	58,800
Atka mackerel	IV	.0300	42,000 7/	4,200	100	29,200
Squid		.0200	28,000 7/	2,800	50	16,650
Other species		.0300	42,000	4,200	2,000	35,800
Total		1.0000	1,400,000	140,000	102,150	1,140,850

1/ Statistical Areas.

2/ Long-term production of individual species groups relative to that of the entire groundfish complex.

3/ Determined by multiplying the total initial TAC, which is fixed at 1.4 million metric tons, times the production factor.

4/ Ten percent initial TAC.

5/ Depleted stocks, production factor set at 50 percent long-term value; pollock production factor increased by corresponding amount to rectify total.

6/ Excluding Pacific halibut.

7/ Reserve for correction of operational problems (17,000 mt) taken from Atka mackerel and squid categories (8,500 mt each) because actual catches have not approached initial species TAC.

harvest, up to a maximum total authorized harvest level of 2,000,000 metric tons, in accordance with the best available biological and socioeconomic information concerning the fishery. Ten percent of the total harvest amount authorized on April 1 shall be apportioned to the final reserve for domestic fishery expansion. The remaining portion of the additional amounts of groundfish authorized for harvest on April 1 will be apportioned to DAH and TALFF.

(ii) * * *

(2) Apportionment to TALFF of reserves and DAH.

(i) Apportionment of Reserves. After consultation with the Council, the Regional Director shall apportion to TALFF the final reserve for domestic fishery expansion according to the following schedule: no more than 40 percent at the beginning of April; no more than 80 percent at the beginning of June; and the remainder of the reserve that has not been apportioned to DAH at the beginning of August. The Regional Director may apportion to DAH at any tme such amounts of the reserve for domestic fishery expansion as he finds will be harvested by United States fishing vessels during the current fishing year.

(ii) Apportionment of DAH. At the beginning of August and after consultation with the Council, the Regional Director shall reassess the amounts of groundfish in DAH and apportion to TALFF such parts thereof as he determines to be appropriate in accordance with paragraph (b)(2)(iii) of this section.

(iii) * * *

(F) Add-on. If, following either of the first two dates specified in paragraph (b)(2)(i) of this section, the Regional Director does not apportion to TALFF or DAH the full portion of the reserve for domestic fishery expansion that is authorized, the non-apportioned part of that authorized amount shall be added to the reserve amounts available for apportionment on the next date specified in paragraph (b)(2)(i) of this section. All of the reserve that has not previously been apportioned must be apportioned to TALFF or DAH by the last date specified in paragraph (b)(2)(i) of this section.

(3) * * *

(ii) * * *

(A) Total allowable catch (TAC) for any groundfish species or species group: The Regional Director shall issue a notice prohibiting fishing using trawl gear for groundfish in the management area, or portion thereof, by vessels subject to this section, until January 1 except that if the TAC for sablefish, turbots, Pacific cod, or "other species" will be reached, the Regional Director shall prohibit fishing for groundfish in that management area or portion thereof by all vessels subject to this section until January 1;

* * * * *

(c) * * *

(2) * * *

(iii) From December 1 to June 1 in the following area: The area bounded by straight lines connecting the following coordinates in the order listed:

54°36'N latitude--164°55'42"W longitude (Cape Sarichef Light)
52°40'N latitude--170°00'W longitude;
55°30'N latitude--170°00'W longitude;
55°30'N latitude--166°47'W longitude;
56°00'N latitude--167°45'W longitude;
56°00'N latitude--166°00'W longitude;
56°30'N latitude--166°00'W longitude;
56°30'N latitude--163°00'W longitude;
56°20'N latitude--163°00'W longitude;
55°16'N latitude--166°10'W longitude;
54°36'N latitude--164°55'42"W longitude (Cape Sarichef Light).

(iv) * * *

(v) * * *

(vi) Trawling by foreign vessels is permitted seaward of three nautical miles from the baseline from which the territorial sea is measured in the area bounded by 170°00' W. and 172°00' W. longitude south of the Aleutians and 170°30' W. and 172°00' W. longitude north of the Aleutians.

(3) Longlining.

(i) Longlining by foreign vessels is permitted in the area west of 170°00' W. longitude and seaward of three nautical miles from the baseline from which the territorial sea is measured.

(ii) Longlining by foreign vessels is prohibited from December 1 to June 1 in water less than 500 meters deep in the following area:

54°36'N latitude--164°55'42"W longitude (Cape Sarichef Light)
52°40'N latitude--170°00'W longitude;
55°30'N latitude--170°00'W longitude;
55°30'N latitude--166°47'W longitude;
56°00'N latitude--167°45'W longitude;
56°00'N latitude--166°00'W longitude;
56°30'N latitude--166°00'W longitude;
56°30'N latitude--163°00'W longitude;
56°20'N latitude--163°00'W longitude;
55°16'N latitude--166°10'W longitude;
54°36'N latitude--164°55'42"W longitude (Cape Sarichef Light).

(4) Field Orders

(i) The Regional Director may issue field orders pursuant to paragraph (f) of this section adjusting time and/or area closures for conservation reasons. The field orders may open or close fishing areas or parts thereof and fishing seasons based upon the following considerations:

(A) The effect of overall fishing effort within a fishing area or part thereof.

(B) Catch per unit of effort and rate of harvest.

(C) Relative abundance of stocks within the area in comparison with pre-season expectations.

(D) The proportion of prohibited species being caught.

(E) General information on the condition of stocks within the area.

(F) Information pertaining to the guideline harvest level prescribed by the State of Alaska for species within a fishing area or part thereof.

(G) Any other factors necessary for the conservation and management of the groundfish resource.

(ii) The Regional Director or his designee may issue field orders pursuant to paragraph (f) of this section opening or closing fishing areas or parts thereof to foreign vessels to solve serious gear conflicts with domestic fixed gear fishing operations. The criteria for implementing such special in-season time-area closures are:

(A) More than two gear loss reports have been submitted by U.S. fishermen.

(B) Foreign vessels are verified by NMFS or the Coast Guard to have been operating in the area of conflict.

(C) A Coast Guard or NMFS patrol unit has visited the area and confirmed the general gear conflict situation as indicated by reports.

(D) Foreign vessels in the area have been contacted by the patrol unit or by radio message advising of the gear conflict, defining the problem area and requesting that the foreign vessels depart the area voluntarily.

(E) Foreign vessels decline to depart the area and domestic fixed gear fishing is continuing and will be disrupted in the absence of the prescribed closure.

(5) Fishing for groundfish in the Bering Sea and Aleutian Islands management area contrary to any field order issued under this subsection is prohibited from the effective date of such field order.

* * * * *

(f) Field Orders.

(1) Contents. Field orders issued by the Regional Director under this part shall include the following information:

(i) The reason for the opening or closure.

(ii) A description of the area to be opened or closed.

(iii) The effective date of such opening or closure.

(2) Public Notice. No field order issued under this section shall be effective with respect to the vessels of a foreign nation until:

(i) It is filed for publication in the Federal Register.

(ii) The foreign nation involved and the designated representative for affected fishing vessels are notified. If possible, notification shall be given at least 48 hours before the field order is to be effective.

(3) Effectiveness. A field order issued pursuant to this subsection shall remain in effect until:

(i) Any expiration date stated in a field order or a notice published by the Regional Director pursuant to this section.

(ii) December 31 of the year in which the field order was issued, whichever is earlier.

4. The authority citation for Part 675 reads as follows:

AUTHORITY: Section 305, Public Law 94-265, 90 Stat. 354-55 (16 USC 1855).

5. In §675.20, paragraphs (c), (d) and (e) are redesignated as paragraphs (d), (e) and (f), respectively.

6. In §675.20, a new paragraph (c) is added, and paragraphs (a), (b), (d), (e)(1), (e)(2), and (e)(3)(vi) are revised, as follows:

§675.20 General limitations

(a) Total allowable catch. (1) The initial total allowable catch (TAC) of each species and species group authorized on January 1, the beginning of the 12-month fishing year, is prescribed in Table 1 of this section, and apportioned to initial reserves and initial domestic annual harvest (DAH) and total allowable level of foreign fishing (TALFF) as set forth in that table. On April 1 of each year, the Regional Director, after consultation with the North Pacific Fishery Management Council (Council), will determine final TAC's for the current year and, in doing so, may authorize by rule additional amounts of each groundfish species or species group, up to a maximum total authorized harvest level of 2,000,000 metric tons in accordance with the best available biological socioeconomic information concerning the fishery. Ten percent of the total harvest amount authorized on April 1 shall be apportioned to the final reserve for domestic fishery expansion. The remaining portion of the additional amounts of groundfish authorized for harvest on April 1 shall be apportioned to DAH and TALFF.

Table 1. Initial Total Allowable Catch (TAC), Domestic Annual Harvest (DAH), and Total Allowable Level of Foreign Fishing (TALFF) Authorized for the Bering Sea and Aleutian Islands Area Groundfish Fishery

Species Group	Areas 1/	Production 2/ Factor	Initial 3/ TAC	Initial 4/ Reserve	Initial DAH	Initial TALFF
Pollock	I, II	.6800 5/	952,000	95,200	19,550	837,250
	III, IV	.0230 5/	32,200	3,220	--	28,980
Pacific Ocean Perch	I, II, III	.0025 5/	3,500	350	1,380	1,770
	IV	.0025 5/	3,500	350	1,380	1,770
Other Rockfish	I, II, III	.0050	7,000	700	775	5,525
	IV	.0050	7,000	700	775	5,525
Sablefish	I, II, III	.0015 5/	2,100	210	930	960
	IV	.0005 5/	700	70	470	160
Pacific cod		.0500	70,000	7,000	43,265	19,735
Yellowfin sole		.0600	84,000	8,400	26,200	49,400
Turbots		.0400	56,000	5,600	1,075	49,325
Other flatfish 6/		.0500	70,000	7,000	4,200	58,800
Atka mackerel	IV	.0300	42,000 7/	4,200	100	29,200
Squid		.0200	28,000 7/	2,800	50	16,650
Other species		.0300	42,000	4,200	2,000	35,800
Total		1.0000	1,400,000	140,000	102,150	1,140,850

1/ Statistical Areas.

2/ Long-term production of individual species groups relative to that of the entire groundfish complex.

3/ Determined by multiplying the total initial TAC, which is fixed at 1.4 million metric tons, times the production factor.

4/ Ten percent initial TAC.

5/ Depleted stocks, production factor set at 50 percent long-term value; pollock production factor increased by corresponding amount to rectify total.

6/ Excluding Pacific halibut.

7/ Reserve for correction of operational problems (17,000 mt) taken from Atka mackerel and squid categories (8,500 mt each) because actual catches have not approached initial species TAC.

(2) When the combined catch by foreign and United States vessels in the fishery or applicable sub-area of the fishery reaches the TAC amount for a species or species group, further fishing which involves the catching or taking of that species is prohibited in the management area or applicable sub-area for the remainder of the fishing year.

(b) Winter Halibut-Savings Area catch limit. (1) Area defined. The Winter Halibut-Savings Area consists of all waters encompassed by straight lines connecting the following points in the order listed:

54°36'N latitude--164°55'42"W longitude (Cape Sarichef Light)
52°40'N latitude--170°00'W longitude;
55°30'N latitude--170°00'W longitude;
55°30'N latitude--166°47'W longitude;
56°00'N latitude--167°45'W longitude;
56°00'N latitude--166°00'W longitude;
56°30'N latitude--166°00'W longitude;
56°30'N latitude--163°00'W longitude;
56°20'N latitude--163°00'W longitude;
55°16'N latitude--166°10'W longitude;
54°36'N latitude--164°55'42"W longitude (Cape Sarichef Light).

(2) Longline. During the period from December 1 to May 31, no more than 2,000 metric tons of groundfish may be taken with longline gear in water less than 500 meters deep in the Winter Halibut Savings Area.

(c) Bristol Bay Pot Sanctuary gear restrictions.

(1) Area defined. The Bristol Bay Pot Sanctuary consists of all waters encompassed by straight lines connecting the following points, in the order listed:

54°36'N latitude--164°55'42"W longitude (Cape Sarichef Light);
55°16'N latitude--166°10'W longitude;
56°20'N latitude--163°00'W longitude;
57°10'N latitude--163°00'W longitude;
58°10'N latitude--160°00'W longitude; and
Intersection of 160°00'W longitude with the Alaska Peninsula.

(2) Trawl. (i) Domestic vessels involved in a species venture are subject to the following restrictions:

(A) A species venture is defined to be any one of the following:

(1) A joint venture using a foreign processor of a particular flag and controlled by either a particular American partner or a foreign entity directly;

(2) An individual factory trawler operation;

(3) A domestic joint venture with at sea processing by a particular processor/buyer;

(4) Trawl-caught deliveries to a particular buyer.

(B) The incidental catch of Pacific halibut in each 20,000 metric ton groundfish catch of a species venture is determined from observer data or other means approved by the Regional Director. Upon achieving a 20,000 metric ton catch, if a species venture's incidental catch

of Pacific halibut exceeds one percent by weight of total catch, the species venture shall be restricted to pelagic trawl gear for the remainder of the fishing year when trawling in the Bristol Bay Pot Sanctuary. If a species venture's incidental catch of Pacific halibut is one percent or less, then the species venture may continue bottom trawling subject to the one-percent incidental catch of Pacific halibut restriction for each additional 20,000 metric ton catch level achieved.

(d) Field orders. (1) If the Regional Director determines that a final TAC will be reached, he shall issue a field order pursuant to §675.22 prohibiting fishing for all groundfish species in the management area or sub-area to which that TAC applies, except that the Regional Director shall not prohibit, under this section, fishing for sablefish by fishing vessels using longline gear unless he determines that a TAC for sablefish will be reached.

(2) If the Regional Director determines that the catch limit specified in §675.20(b)(2) will be reached, he shall issue a field order pursuant to §675.22 prohibiting longlining in waters less than 500 meters deep in the winter halibut savings area until June 1.

(3) The Regional Director may issue field orders pursuant to §675.22 adjusting time and/or area closures for conservation reasons. The field orders may open or close fishing areas or parts thereof and fishing seasons based upon the following considerations:

(i) the effect of overall fishing effort within a fishing area or part thereof;

(ii) catch-per-unit of effort and rate of harvest;

(iii) relative abundance of stocks within the area in comparison with pre-season expectations;

(iv) the proportion of prohibited species being caught;

(v) general information on the condition of stocks within the area.

(vi) information pertaining to the guideline harvest level prescribed by the State of Alaska for species within a fishing area or part thereof; or

(vii) any other factors necessary for the conservation and management of the groundfish resource.

(4) Fishing for groundfish in the Bering Sea and Aleutian Islands management area contrary to any field order issued under this subsection is prohibited from the effective date of such field order.

(e) Apportionment to TALFF of Reserves and DAH.

(1) Apportionment of Reserves. As soon as practicable after each of the following dates and after consultation with the Council, the Regional Director shall apportion to TALFF all or part of the final reserve for domestic fishery expansion according to the following schedule: not more than 40 percent at the beginning of April, not more than 80 percent at the beginning of June, and the remainder of the reserve that has not been apportioned to DAH at the beginning of August. The Regional Director may apportion to DAH at any time such amounts of the reserve for domestic fishery expansion as he finds will be harvested by United States fishing vessels during the current fishing year.

(2) Apportionment of DAH. At the beginning of August and after consultation with the Council, the Regional Director shall reassess the amounts of groundfish in DAH and apportion to TALFF such parts thereof as he determines to be appropriate in accordance with paragraph (e)(3) of this section.

(3) * * *

(vi) Add-on. If, following the April or June scheduled apportionment specified in paragraph (e)(1) of this section, the Regional Director does not apportion to TALFF or DAH the full portion of the reserve that is authorized for apportionment on that date, the non-apportioned part of that amount shall be added to the reserve amounts available for apportionment on the next date specified

in paragraph (e)(1) of this section. All of the reserve that has not previously been apportioned must be apportioned to TALFF or DAH by the last date specified in paragraph (e)(1) of this section.

* * * * *

7. In §675.22, paragraph (c) is removed.